DEVOTED TO
TEXTILE CHEMISTRY
AND
WET-PROCESSING
BLEACHING
DYEING
PRINTING
FINISHING

AMERICAN

DYESTUFF REPORTER

JULY 11, 1949
VOLUME 38, No. 14

Put it in print with VAT COLORS

Du Pont vat color pastes for printing cottons and rayons—PONSOL* and LEUCOSOL* colors (anthraquinone-type dyes)...SULFANTHRENE* colors (thioindigoid-type dyes).

The physical properties of these products are especially controlled to yield a full range of shades in printing. They offer the best all-round fastness obtainable... help assure customer satisfaction. E. I. du Pont de Nemours & Co. (Inc.), Dyestuffs Div., Wilmington 98, Del.

*Reg. U. S. Pat. Off.

Du Pont Dyestuffs

DU PONT
REG. U. S. PAT. OFF.

BETTER THINGS FOR BETTER LIVING... *THROUGH CHEMISTRY*

OFFICIAL PUBLICATION
of the
PROCEEDINGS
AMERICAN ASSOCIATION
OF TEXTILE CHEMISTS
AND COLORISTS

new!

exceptionally fast to light

Superlitefast DIRECT DYES

REG. U.S. PAT. OFF.

ORANGE **LLLWF**

Features:

- ★ 150-300 hours light fastness
- ★ extremely level dyeing in all percentages
- ★ leaves acetate white
- ★ exceptional wash fastness at 160°F. *with soap and soda, even without resin treatment*
- ★ light fastness is not materially affected with curable resins.

ALTHOUSE
Chemical Company, Inc.
READING • PA.

pace-setter in precision dye-making

AMANTHRENE* VAT COLORS
provide the answer to the demand for
better color fastness in textiles.

Amanthrene

BRILLIANT GREEN J

in double paste or double powder form

A mellow, full-toned Jade . . . for every form.
of cotton and rayon . . . by every method of vat application.
Pleasing as a self-shade, notably satisfactory in combination.

Excellent printability on fine cotton and rayon dress fabrics
and draperies . . . equally suitable for dyeing these fibres.
Imparts remarkable fastness to light, washing,
chlorine or peroxide bleaching and soda boiling.

Another of the Amanthrene range of superior vat colors.
For detailed information on the whole range available, as well as
data regarding your own particular requirements, consult our nearest branch.
A.A.P. technicians are always happy to be of service.

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50 Union Square, New York, N. Y. • **Plant: Lock Haven, Pa.** • **Branches:** Boston, Mass.
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*Reg. U. S. Pat. Off.

Lower Production Costs of Premium Quality Goods with

GLASCO *Stainless Steel* ENCLOSED DYE BECK

*** COMPACT CLOSE-FITTING HOOD**

SAVES SPACE-MINIMIZES DRIPPING
PERFECTLY BALANCED FOR EFFORTLESS OPERATION

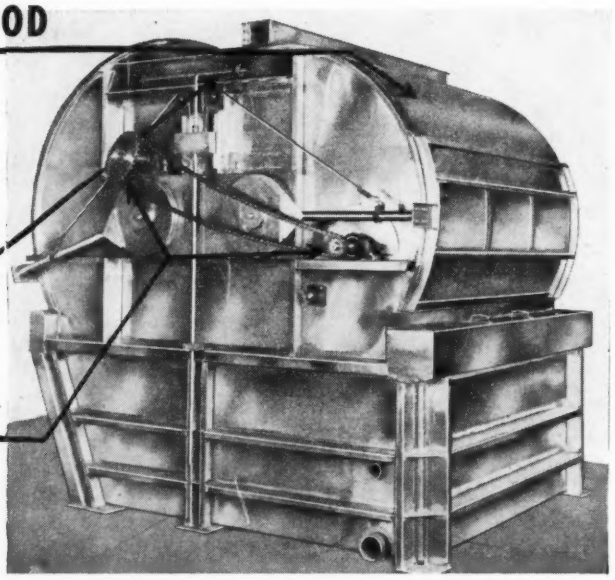
*** AUTOMATIC STEAM VENT**

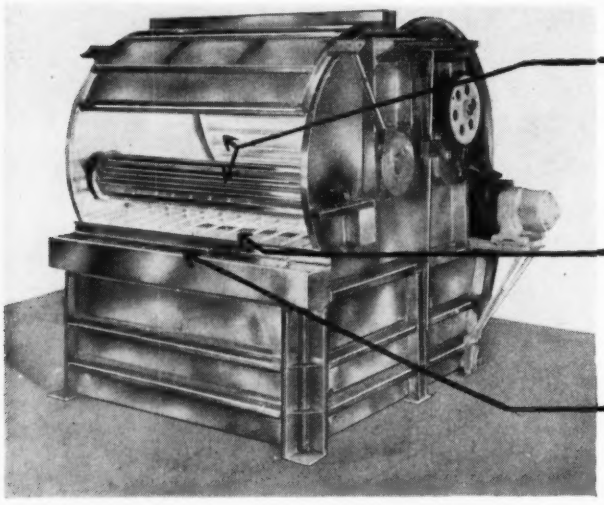
OPENS WITH DOOR-PREVENTS STEAM BLAST

*** SYNCHRONIZED REEL DRIVE**

FEEDS FABRIC TO OVAL REEL WITHOUT PULL OR DRAG BETWEEN REELS

PATENT PENDING





*** TITE-GRIP REELS**

LOOP ACTION GRIPS FABRIC FIRMLY
AVOIDS FRICTION DAMAGE SOLID NON-FLEXING DESIGN FOR LONG REEL LIFE

PATENT PENDING

*** OVERFLOW WASH**

REMOVES SURFACE SCUM FROM MIDDLE AND SIDES OF TUB

*** AUTOMATIC COLOR DISTRIBUTION**

POUR COLOR IN AT ONE POINT
DISTRIBUTION IS UNIFORM AND AUTOMATIC

Time and money-saving features of these new stainless steel dye becks:

1) TITE-GRIP REELS with synchronized reel drive.
2) PULL, DRAG, AND FRICTION REDUCED to a minimum, without cloth wrapping of reels.
3) LONGER, MORE UNIFORM PLEATS and more uniform piling without "picnics"
4) HEAVIER LOADS ARE POSSIBLE.
5) AUTOMATIC COLOR DISTRIBUTION assuring even colors without special care.
6) AN OVERFLOW WASH FEATURE for quicker, cleaner washes.

For full facts address

GLASCO EQUIPMENT CORPORATION

Metal Equipment Fabricators Since 1916

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palatines
for wool

palatine fast dyestuffs

more production with less manpower

. . . offer the lowest coloring costs for quality results.

. . . approach chrome color fastness (without the addition of chrome) by simple acid dyeing process.

. . . are fast to light, washing, perspiration, crocking, sea water and wear.

. . . are level dyeing on mixed wool and carbonized goods without neutralization—with excellent penetration. Most types are dischargeable with Rongalite.

. . . are particularly suitable for men's wear, dress goods, gabardines, tropical worsteds, cloakings, bathing suits, knitting yarns, carpet yarns and tops.

. . . on wool-nylon mixtures they produce good tone in tone dyeings of very good fastness to light and washing.

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NYANZA

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TEXTILE CHEMICALS

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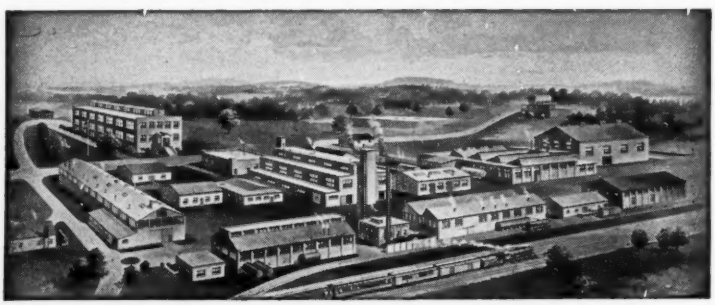
FINISHING MATERIALS

FOR

WOOL — COTTON — RAYON — ACETATE
AND MIXED FIBERS



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REPCOLENE
K-50
..... applicable
to all fabrics
REPCOLENE K-50 has a wide field of application as a
penetrating—scouring—wetting—leveling, dispersing agent
STABLE IN HARD WATER—COMPATIBLE WITH SOAP
REPCOLENE K-50 has great softening action on animal and vegetable fibres.
REPCOLENE K-50 is economical as it greatly reduces the amount
of finishing compound required after scouring and dyeing operations
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REFINED PRODUCTS CORPORATION
Manufacturing Chemists • LYNDHURST • NEW JERSEY

NO MORE *TIPPY* WOOL

with

ANTHOMINE*

on the job!

IN ALL WOOL DYEING OPERATIONS *ANTHOMINE* INCREASES THE AFFINITY OF WOOL FIBRES FOR DYESTUFFS.

THIS RESULTS IN LEVEL SHADES WHEN DYEING STOCK, YARN OR PIECE GOODS.

TIPPY AND BLENDED WOOLS ARE DYED A SOLID SHADE BY ADDING *ANTHOMINE* TO THE DYE BATH.

Mills throughout the country use* ANTHOMINE *for:

- **Even dyeing**
- **Brighter, fuller shades**
- **Quicker, better exhaustion of dyebath**
- **Softer, more pleasing "hand"**
- **Reduced processing time**

Send for Technical Service Bulletin #203-100.2 for complete information, including how to use ANTHOMINE for Top and Yarn Dyeing, Pressure or Package Dyeing, Leveling Unevenly Dyed Yarn or Shady Pieces, Dyeing Metallized Colors, etc.

Arkansas Co. INC.

Manufacturers of Industrial Chemicals for Over 40 Years

NEWARK, NEW JERSEY

*Reg. U.S. Pat. Off.

the end of horse and buggy days

for stainless sheet and strip

Automobiles were once designed as horseless carriages—even to the dashboard socket for a needless whip. Stainless steel production, too, once struggled thru horse and buggy thinking. More power, heavier rolls, more care in surface finish—and stainless sheet and strip came forth a step-child of carbon steel methods. Today's modern strip mills have changed this, giving stainless production new concepts of quality.

CRUCIBLE, one of the pioneers in stainless steel, has gone still further. Now, *for the first time*, hot and cold rolled stainless steel is made a *specialty product*, by specialty production methods, in a mill built specifically for this purpose—in widths from 1½" to 50" inclusive, and in all gauges, grades and finishes.

This is more than merely another source of supply. For, with this new mill at the Midland Works and the Trent Tube Co. joining the organization, CRUCIBLE can now supply you with *every* form of stainless. And, in sheets, plates, strip, bars, tubing, forgings, wire and castings, you can rightly expect the best that modern facilities and generations of *specialty product* leadership can provide.

CRUCIBLE STEEL COMPANY OF AMERICA,
405 Lexington Ave., New York 17, N. Y.

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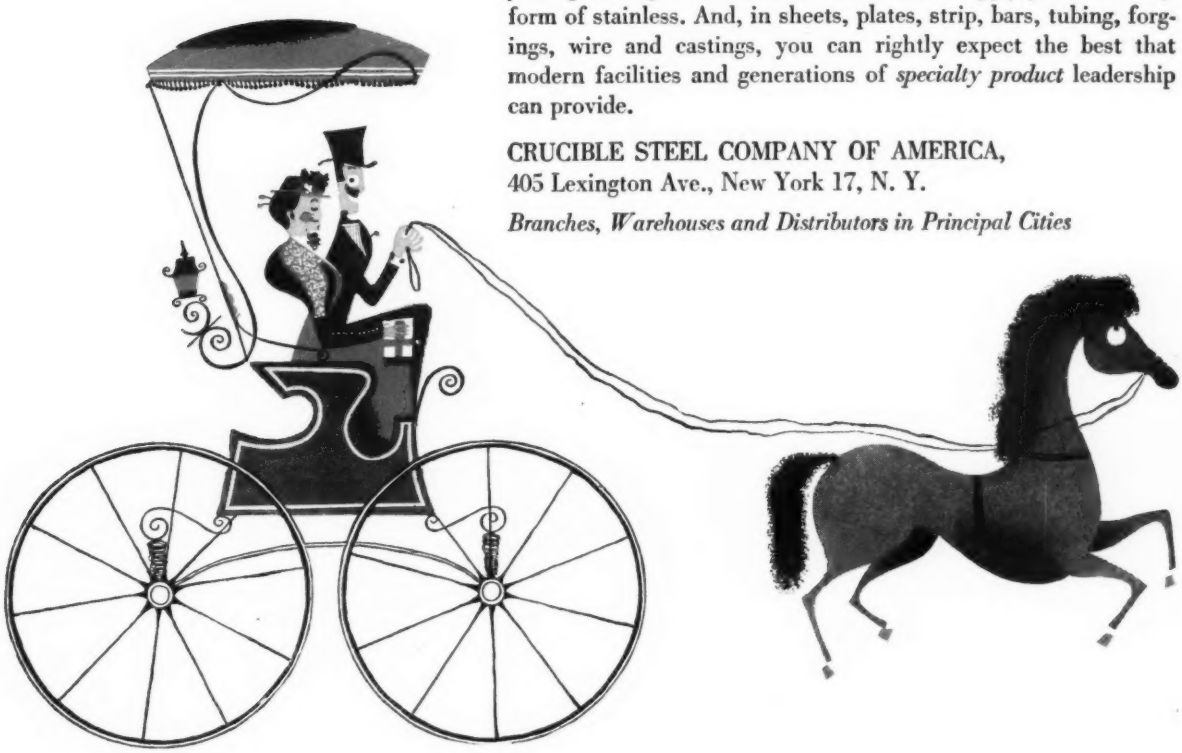


CRUCIBLE first name in special purpose steels

hot and cold rolled **STAINLESS SHEET AND STRIP**

STAINLESS • HIGH SPEED • TOOL • ALLOY • MACHINERY • SPECIAL PURPOSE • STEELS

FOR YOUR INFORMATION

Wool Spinners' Report

Actual reports from mills tell how Syton delivers better, lower-cost production for worsted and woolen spinners. Identifying information has intentionally been deleted from the following excerpts, but each represents a bona fide report of Syton's success at a specific mill.

Speed-up of cards

"Syton has permitted a speed-up of the cards equivalent to 5% or more. Net yield of cloth from fibers placed in process appears to be 3 to 3½% better."

Finer Counts

"The entire mill . . . is now running on Syton with good results. Top, 64-70's was being spun into 46's and 50's yarn. By the use of Syton, the mill has been able to spin 60's and 64's from this stock. This is not only a difficult spin but an expensive yarn for an expensive fabric. A check on all the spinning frames revealed only two ends down."

"Mill is convinced it can now spin with Syton a yarn that is four counts higher than the limit spin for untreated stock. From the top of an average of 54's grade, 32's are easily spun and sometimes 36's yarn. From 58-60 top, 36's are regular production."

Increased yarn yields

"Mill which is now using Syton on all its blends is realizing about 3½% increased yarn yields, 5 to 10% greater card speeds, and improved spinning. These figures are based on production of about 700,000 pounds of stock."

Faster Carding

"Card room now is running five days a week and keeping the weave room on a six-day shift. Previously it was necessary to run the cards six days to keep the weavers busy five days per week. Part of the credit for faster carding was due to a change in stock. Syton is credited with a minimum increase of four per cent in card-room production."

Better carpet yarns

"In this mill's years of spinning carpet yarns, there never was sufficient condensing of the fibers at the aprons until they used Syton."

Fewer ends down

"Mill used Syton on a difficult 50-50 wool-rayon blend, making a 36's yarn, and reduced ends down from 200 to 50."

For more information on the product, or technical help, just send the handy coupon.

NEWS from Mills on Acetate Sizing

For surface-saponified acetate

Mill reported that a 5% formula did an excellent job for surface-saponified acetate. Weaving results were better than ever attained previously.

Less filling breaks

Representatives of two mills highly pleased with Stymer; one mill reports less filling breaks when weaving on Stymer warps.

Non-Stop

Mill is pleased with Stymer for acetate and reports that seven looms are running with no 'snowballs' or stops.

Weaving efficiency up

Mill reports weaving efficiencies of Stymer-sized warps on 10 looms are from three to six per cent higher than those sized with gelatin.

STYMER Mill Data Record

The following data taken from an actual mill run is typical of Stymer's performance on the slasher and on the loom.

WARP DATA
Yarn 75/20/3 Bright Acetate
Sley 104 Ends 4108 Yards 40,000
Picks 76
Style Taffeta

SIZE MIX
Strength 5% Formula 42 lbs. Stymer S Temperature 150°F Gals. 100
Remarks: Stymer S added to hot water with vigorous agitation boiled for 30 minutes. Clear, uniform solution. No difficulty in preparation.

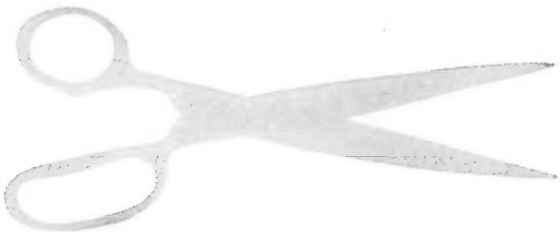
SLASHING DATA
Type: Johnson 7 Can Speed: 30 yds. per min.
Size Roll—Bare Rubber Roll
Can Temperatures { No. 1–160°F No. 2–180°F No. 3–200°F No. 4–210°F / No. 5–210°F No. 6–200°F No. 7–150°F
Can Coverings: None Stretch 3%
Appearance: Uniform well sized yarn
Remarks: Slashing performance was excellent—warps characterized by flexibility and smoothness of handle.

WEAVING DATA
Loom Speed: 150 ppm.
Relative Humidity: 70% Temperature—82°F
Weaving Efficiency: 95%
Remarks: Stymer sized warps wove most satisfactorily. Weaving results were superior to standards previously attained for this construction.

News about Monsanto Textile Chemicals ▯ July 1949

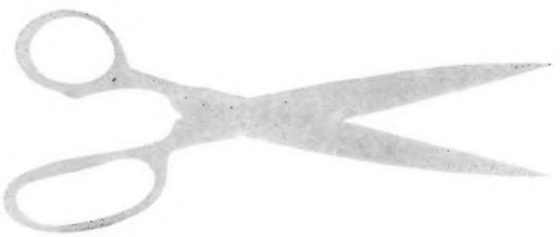
When costs are high...

Now, when operating schedules have been cut, it's more important than ever to get the last dime of profit from current production. Syton and Stymer help mill men do that with higher quality at lower cost.



SYTON for wool spinning

Woolen and worsted spinners clip costs with Syton because this dispersion gives them from 10%-to-30% more yarn strength. Added yarn strength, for example, gives mills fewer ends down during spinning and weaving . . . better roping condensation, reduced fly and card waste. Many mills report they can increase salability by spinning blends hitherto impractical. Almost all mills say they can spin any stock to a finer count with Syton. Better production, at lower cost!



STYMER acetate size

Acetate Mills produce less expensively with Stymer size which forms a tough, smooth, flexible film. In slashing, Stymer doesn't stick to uncovered dry cans, it stops static electricity troubles, and doesn't waste valuable mill time by setting in the pipes or size box. In weaving, Stymer-sized warps show little or no shedding, maintain yarn twist, and have fewer end breaks. Greater efficiency, greater economies!

MONSANTO
CHEMICALS — PLASTICS

SERVING INDUSTRY . . .
WHICH SERVES MANKIND

MONSANTO CHEMICAL COMPANY, Textile Chemicals Department
Desk ADT, 21, Everett Station, Boston 49, Mass.

Please send me information on
Syton Stymer

Name Title

Company

Address

City Zone State

Syton, Stymer: Reg. U. S. Pat. Off.

The President took the Bows

(but the chemist* got the raise)

THE PRESIDENT didn't jump with joy when the Important Stockholder said, "Now I'd like to see the plant." It sounded like his dentist saying, "Now let's take a good look at that chopper."

AS THEY ENTERED the dye room, the Important Stockholder's eyes got the glint of a kid's surveying a favorite bannister. "Not much different from what it was in my time," he concluded after seven steps. Three steps ahead, a man who was wiping off a test beaker said, "Improved somewhat, though."

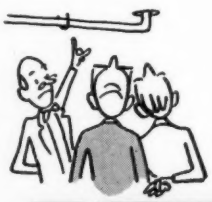
The President said, "This is our chief chemist."

The chief chemist nodded in agreement. "Take these dyes, for instance," he told the I.S., "we add a little Calgon to them these days."

"CALGON?"

"Yes," the chemist got chemical, "it's sodium phosphate glass."

"In fact," said the President, "it's the original sodium phosphate glass. Makes the dyes less sensitive to calcium, magnesium and so on. Gives us clearer colors."



"THAT WATER PIPE over your head," the chemist said, "looks like the water pipe you used to work under. But the water in this one is treated with Calgon. Calgon controls corrosion—saves pipes. Besides, it cuts down on iron pick-up . . . brightens shades sensitive to iron . . . "

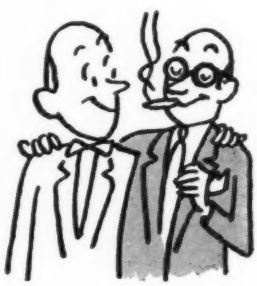
"It reduces danger of rust stains," the President broke in, "it saves us plenty on peroxide, too. The list is a mile long."

THE IMPORTANT STOCKHOLDER said, "Then we better move along," as he took the President's arm in a friendly fashion.

At the scouring mill, the President let it slip out that Calgon was added to soften the water. "We remove size more thoroughly that way," the chemist explained. "We get whiter goods and we prevent the formation of lime soap film."

At the kier boil, the chemist waited till the Important Stockholder lighted the President's cigar. "We get the cotton cleaner now," the chemist said. "Better color, too. Means we can use a milder bleach. Calgon* again."

ON THE WAY BACK, the Important Stockholder told the President, "Just like I said, things aren't much different around here than they were in my time. We're still on top because we're still up to the minute on the latest and *best* methods. You know," that wouldn't be a bad topic for discussion at the next directors' meeting."



*T. M. Reg. U. S. Pat. Off.

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BUROMIN
CALGON

calgon, inc.

A SUBSIDIARY OF
HAGAN CORPORATION

HAGAN BUILDING
PITTSBURGH 30, PA.

you'll sleep soundly, mister, when you use...

ETERNALURE

RESIN FINISH FOR NYLONS

IF YOU'RE worrying about the high proportion of menders and seconds you get on your nylon production... If your present finishing methods give you too much shine... If your sales department is asking for better looking, more snag resistant hose...

It's time you tried ETERNALURE

It will give you better selling nylons with a dainty, smooth fitting finish that is unaffected by unlimited washings. Properly dulled, with better clarified stitch, your hose will also have superior snag resistance.

In the plant, menders and seconds will be minimized because with ETERNALURE you get mighty few pull threads. Hose are easier to handle also because of their good body—even on the sheerest numbers.

You don't have to make any operational or process changes to use ETERNALURE. There's no call for heating or curing. It's easy to make a mill run. Then you can let the breakdown report prove its all around superiority as a finish.

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CHOOSE YOUR OWN (denier / boarding system / hand) **COMBINATION**

. . . and be safe. Yes, safe because any combination that you select will respond to Fanco finishes. No matter the denier, the hand, the boarding system or special properties that you want for your stockings, Fanco finishes will give them to you accurately, continuously. They will seal in the beauty of fine knitting . . . add lasting loveliness, clear dullness and protection to every stitch. Ask your Fanco fieldman for a no-obligation, on-the-spot test.

W. F. FANCOURT CO.

In the South, Howard A. Virkler, Greensboro, N. C. *Philadelphia, Pa.*

SOLVING FINISHING PROBLEMS SINCE 1904

for plain or dischargeable dyeing of acetate yarn and nylon

KINGSPORT, TENNESSEE

EASTONE

YELLOW RN Concentrated

Eastone Yellow RN Concentrated is recommended for application printing on cellulose acetate yarn. It is of interest either as a self-shade or as a shading component in the dyeing of dischargeable ground shades. It dyes clear golden yellow shades which have unusual brightness even in pale tints.

Yellow RN Concentrated has very good solubility. When dyed over a temperature range of 160° F. to 190° F., it produces level dyeings with good exhaustion of the dyestuff. Either a jig or box may be used. Resistance of Yellow RN Concentrated to gas fading, sublimation, and hot pressing is excellent. The color may be stripped from dyed pieces with an acidified solution of zinc formaldehyde sulfoxalate.

Eastone Yellow RN Concentrated is one of an expanding line of Eastman Acetate Dyestuffs especially developed for cellulose acetate yarn. Further information on these dyestuffs and their application may be obtained by writing Tennessee Eastman Corporation (Subsidiary of Eastman Kodak Company), Kingsport, Tennessee.

astman cetate yestuffs

• Eastman Acetate Dyestuffs are sold in the United States through Tennessee Eastman Corporation in Kingsport, Tennessee, and Lodi, N. J.; in Canada, through Clough Dyestuff Company Ltd., 33 St. Mathieu Street, St. Laurent, Quebec.

phia, Pa.

. 1949

the Best Test

is the Heat Test!

A. GROSS PRODUCTS

Stearic Acid
Tallow
Fatty Acids
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White Oleine
Coconut
Fatty Acids
Cottonseed
Fatty Acids
Soya Bean
Fatty Acids
Saponification
Crude Glycerine
Stearine Pitch
Cottonseed Pitch
Hydrogenated
Tallow Fatty Acids

A. GROSS' STEARIC ACID is put through more than the usual laboratory tests that fatty acids fall heir to. It holds its own against any Stearic Acid on any count. But there's one test on which Gross Stearic Acid stands supreme—the standard Gross Heat Test.

This Heat Test is the reason Gross Stearic Acid is noted for its color stability, whiteness, and uniformity. For no Gross Stearic Acid is ever shipped out unless it meets the rigid specifications of this test.

When you use Gross Stearic Acid you can be sure of longer shelf life and expanded "sales-ability" of your products. Write today for our free booklet, "Fatty Acids in Modern Industry." This and a sample will be sure to convince you.

Manufacturers since 1837
FACTORY: Newark, N. J.

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FACTORY: NEWARK, N. J.

HOW THIS PATTERN WAS PRINTED IN *Italy*

'Round The World With Aridye

In Italy, where printing economy is all-important, plants like Cotonificio Bustese of Busto use Aridye® Pigment Colors for high-quality, *low-cost*, printing of a wide range of cotton, rayon, and spun rayon fabrics.

This progressive Italian plant produced the pattern illustrated on spun rayon dress goods with the following formulas: RED: Aridye Red LDB cut 1:5 with Aridye Clear 6214; PINK: Aridye Red LDB cut 1:50; GREEN: 2 parts Aridye Green FJB and 1 part Aridye Yellow FY2G cut 1:2; BLACK Aridye Black FK cut 1:1.

After printing, the fabric was dried and heat treated. No ageing, soaping, or other after treatment was necessary. The soft hand of the fabric was unimpaired.

Note the sharpness of mark, the unusual color combination, and the bright green peg —all made possible by the use of Aridye Pigment Colors.

Like Cotonificio Bustese, leading textile printers in many parts of the world are becoming increasingly aware of the many advantages of Aridye Pigment Colors. An Interchemical technical representative will be glad to discuss the numerous ways in which they will be of benefit to you. For full details, write to Interchemical Corporation, Textile Colors Division—Box 357, Fair Lawn, N. J.

Aridye *olors*

CHECK THESE EIGHT ADVANTAGES

Sharpness of Mark • Exceptional Fastness to Sunlight • Uniformity of Shade • Fastness to Washing • Bright Colors • Economy • Ease of Application • No Impairment of Hand

INTERCHEMICAL CORPORATION, TEXTILE COLORS DIVISION • FAIR LAWN, N. J. • ROCK HILL, S. C. • PAWTUCKET, R. I.

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ONE COLOR FOR BOTH DYEING AND PRINTING

INTERCHEM ACETATE

YELLOW G

Interchem® Acetate Yellow G gives you these advantages:

Provides brilliant, clean shades at all concentrations.

Produces bright greens in combination with Interchem Acetate Blue B.

Suitable for both dyeing and application or discharge printing.

Disperses rapidly and completely when pasted with water.

Has good pile on; top money value.

No specking, no tarring—hence fewer redyes, fewer seconds.

For complete information and sample of Interchem Acetate Yellow G write to:

Interchemical Corporation—Textile Colors Division
Box 357, Fair Lawn, N. J.

Interchem TRADE MARK *Dyes*

They're both right! For today, most textilemen know that the use of a soap or a synthetic in wet processing operations depends on the nature of the operation, the properties of the fiber, etc. Some operations call for high wetting and penetrating action—others for high detergency or emulsifying power. That's why certain textile processes call for soaps, others for synthetics . . . and Armour makes the best of both. For instance . . .

You need a soap—

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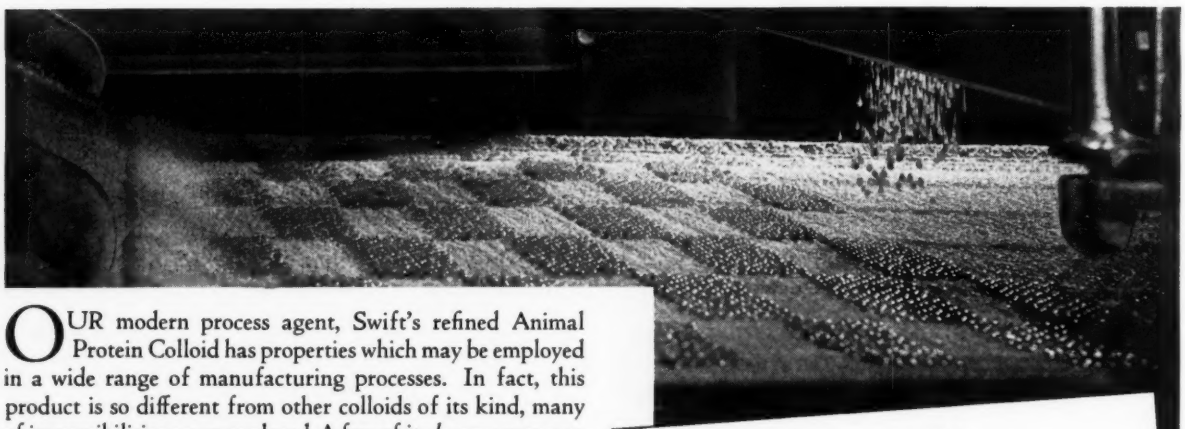

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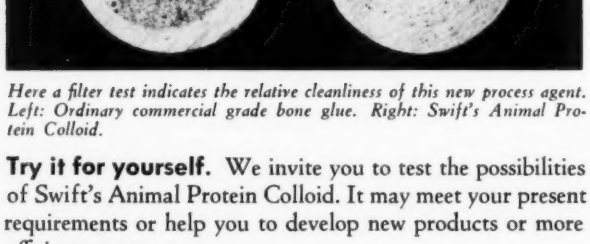

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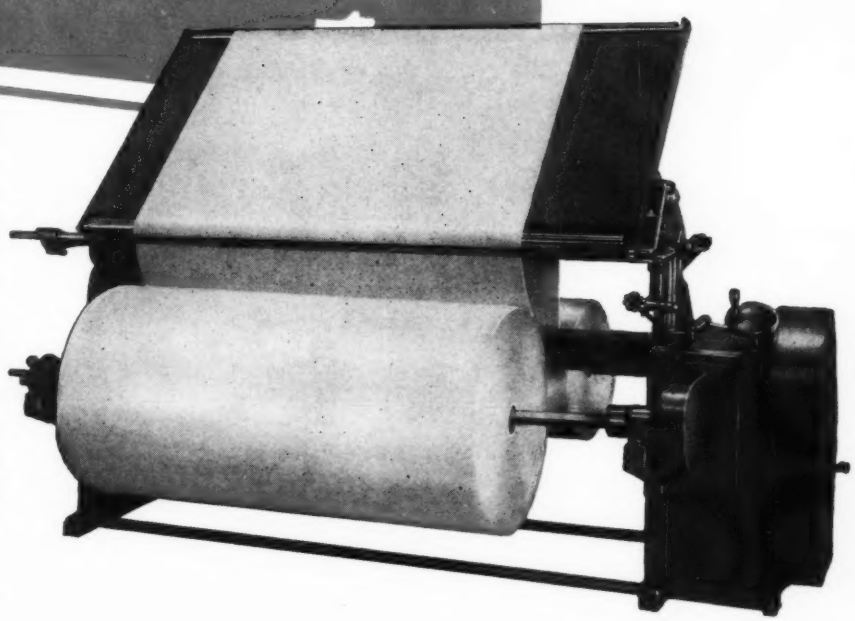

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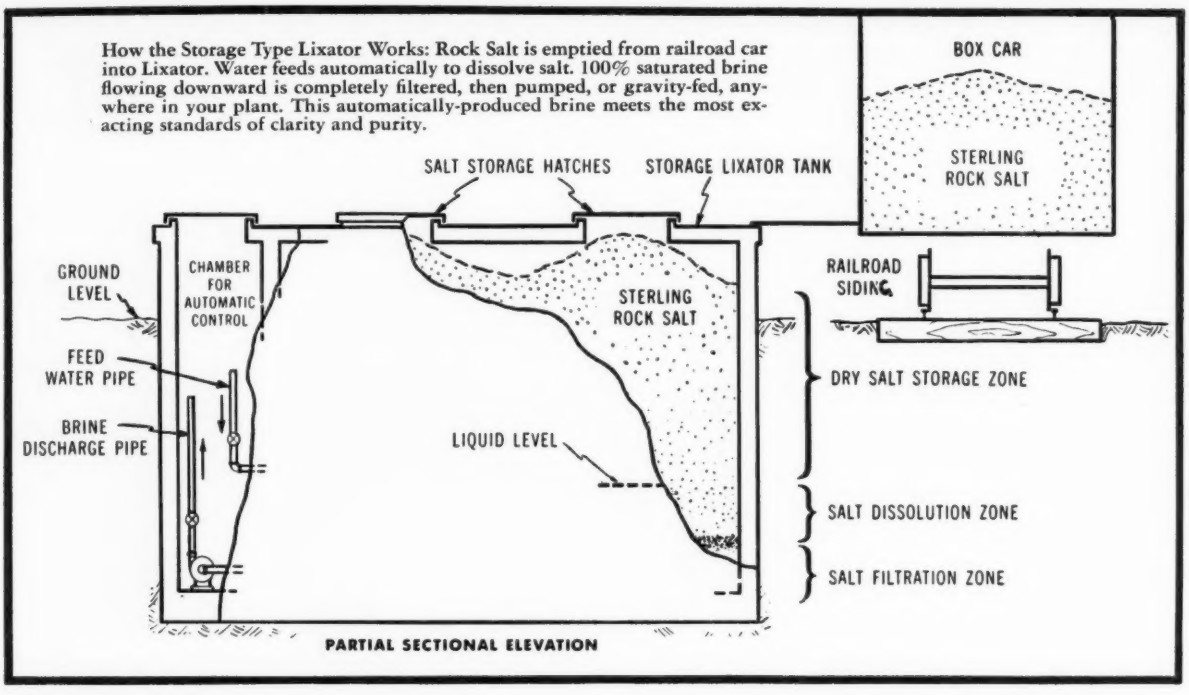
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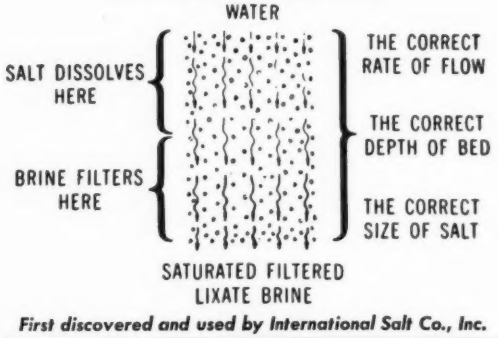

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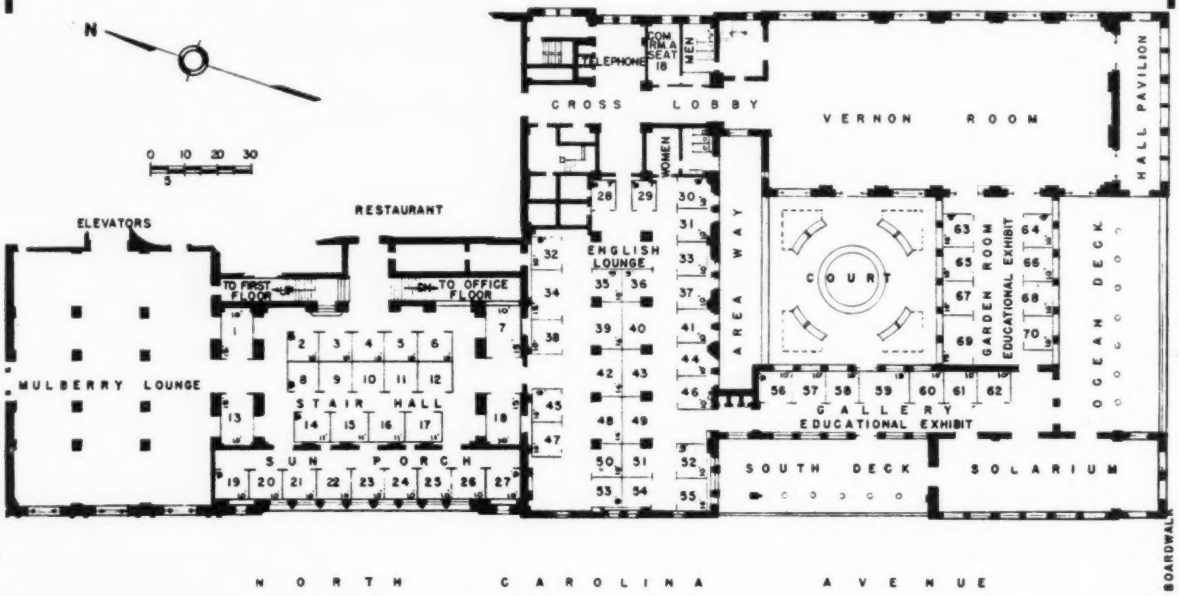

Exhibit Area at Chalfonte-Haddon Hall

The list of exhibitors at the Atlantic City Convention of the American Association of Textile Chemists and Colorists, Chalfonte-Haddon Hall, October 13-15, is growing daily. Exhibit space is open to the textile and allied industries, as well as institutions interested in textile education. There still is space available but don't wait until it's too late —get your reservation in early. The following firms and educational institutions had reserved exhibit space as of June 24th:

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12	Daily News Record
14 and 15	Smith, Drum Co.
16	Textile Bag and Specialties Co.
17	Calgon, Inc.
18	General Dyestuff Corp.
31 and 33	Reliance Electric & Engineering Co.
32	National Milling & Chemical Co.
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49	American Viscose Corp.
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JULY 11, 1949

VOLUME 38 NUMBER 14

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AMERICAN
DYESTUFF REPORTER

VOLUME 38 July 11, 1949 NUMBER 14

NONIONIC COMPOUNDS, THEIR EMPLOYMENT IN THE TEXTILE INDUSTRY*

J. P. SISLEY
Ingenieur Chimiste E.C.I.L.
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Translated by
P. J. WOOD
Technical Director, Royce Chemical Co.

SOAPS and synthetic detergents have been the subject of numerous studies, both theoretical and practical. These newcomers in the field of synthetic chemistry have been cradled in the textile industry.

Synthetic detergents generally consist of a hydrophobic paraffin chain whose distribution in water is produced partly by the electro-valence of the ionic ester groups and partly by hydrophilic groups which promote dispersion or solubilization by setting up secondary valancies in the molecule.

Surface active compounds are divided into two main groups:

The first constitutes the class of colloidal electrolytes or compounds containing active ions (anion- and cation-active).

The properties of this group (solubility in water, surface activity, reaction with other ions, etc.,) are characterized by the reaction of equilibrium between the forces of attraction and the forces of electrovalence.

The second group has pretty well the colloidal character of soap, but does not have the property of forming salts. This colloidal behavior and surface activity result from a molecular construction characterized by a greater or lesser content of accumulated hydrophilic molecules.

This class of micellar colloids or nonionic compounds is the subject of this treatise. They exhibit a superior stability toward saline solutions and the salts of heavy metals and alkaline earths, as compared with that of anion- and cation-active compounds of the same solubility. Most of them are stable to acids and alkalies and, at the same time, are compatible with anion- and cation-active compounds.

It has been found that anion- and cation-active compounds show increased emulsifying and softening powers when mixed with nonionic compounds. They are also compatible with a large variety of solvents and lipides.

They are divided into three main classes according to their behavior toward water:

1. Nondispersible types.
2. Dispersible types.
3. Soluble types.

The nondispersible types consist generally of the fatty acid esters and the esters of polyhydric alcohols (glycerol, glycol, sorbitol, etc.) They are emulsifying agents which augment the action of soaps, fatty alcohols and alkylaryl sulfonates and possess a certain amount of interest as softeners in finishing operations.

The dispersible types are close relatives of the foregoing and are excellent assistants for producing emulsions of both types, water-in-oil and oil-in-water. They are recommended for use in compounds for oiling textile fibers for spinning and warp sizing and as additions in the compounding of foaming agents, softeners and detergents. This class includes certain esters of sorbitol, sorbitan and mannitan, also the esters of polyethylene glycols containing more than 4-5 ethoxy groups. These are softening agents and emulsifiers.

The soluble types produce opalescent or completely clear solutions. In this group are found compounds possessing softening and penetrating properties, particularly in aqueous solutions containing electrolytes and metallic salts.

These products have considerable importance in the textile industry, as they supply the answer to certain problems which cannot be solved by the use of soap or anion-active detergents.

Classification of Nonionic Compounds

I—Products obtained by polymerizing ethylene oxide.
II—Products obtained by condensation of fatty bodies or their derivatives with ethylene oxide.
II/A—Derivatives of fatty acids.
II/B—Derivatives of fatty alcohols.
II/C—Derivatives of fatty amides.
II/D—Derivatives of fatty amines.
III—Products obtained by condensation of oxyalkylaryl compounds with ethylene oxide.
III/A—Derivatives of alkyl phenols.
III/B—Derivatives of alkyl naphtols.

There are in existence other derivatives, but they have not yet been introduced into the textile industry:

Products of condensation of phosphatides with ethylene oxide, and of alginic acid with ethylene oxide.

Fatty acids condensed with ethylene oxide are not considered as detergents as their functional ester renders them un-

* An address on the Occasion of the 75th Anniversary of the Founding of the Technical School, Verviers, Belgium.

stable to acids and alkalies. They are recognized as emulsifiers and softeners.

The polyglycol ethers obtained by reacting alkyl oxides with compounds containing easily replaceable hydrogen atoms are shown to possess remarkable properties. As these products are not salts, they are readily soluble in oils and facilitate the formation of emulsions. On account of their faculty of hydration, which is greater in the cold than hot, these compounds exhibit the astonishing properties of being transformed into a sparingly soluble form, losing water of hydration under the influence of heat.

They separate from the solution in the form of oil or crystals. This property is profitably employed in the washing operation. The appropriate ethyl oxide condensation products have the power, at the boiling temperature, of fixing themselves on the fiber. There results a migration of soil and fatty substances. The soil is surrounded by the oil. During the course of the rinsing operation, at a lower temperature, the glycol ether dissolves and carries away the impurities.

On account of their nonionic structure, these compounds have no affinity for textile fibers. Their properties depend on the length of the aliphatic chain and also on the degree of oxyethylation. An important member of this class, Leonil O, (oleyl alcohol condensed with 20 molecules ethylene oxide) is considered a good detergent for wool. It does not give much foam and is less soluble at high temperatures. Lauryl alcohol condensed with ethylene oxide gives products more soluble but with less detergent power.

The dispersing power of these compounds toward lime soaps is superior to that of comparable colloidal electrolytes.

With the objective of developing new types of surface-active compounds and with the idea of becoming independent of natural fats, alkylphenols and alkylnaphtols have been studied as replacements of fatty alcohols.

By varying the amounts of the phenolic and naphtholic components as well as the amount of combined ethylene oxide, specific materials are obtained for the problems of dyeing and washing.

Figure 1 shows the effect of variation of the ethoxy chain on several of the properties of this class of products. Pure esters were prepared by the action of dodecyl alcohol and polyethylene glycol and these were compared with technical products made by condensing an alcohol with ethylene oxide.

In the class of entirely synthetic nonionic products, the condensation of different proportions of ethylene oxide with isooctylphenol led to the production of compounds of analogous structure but

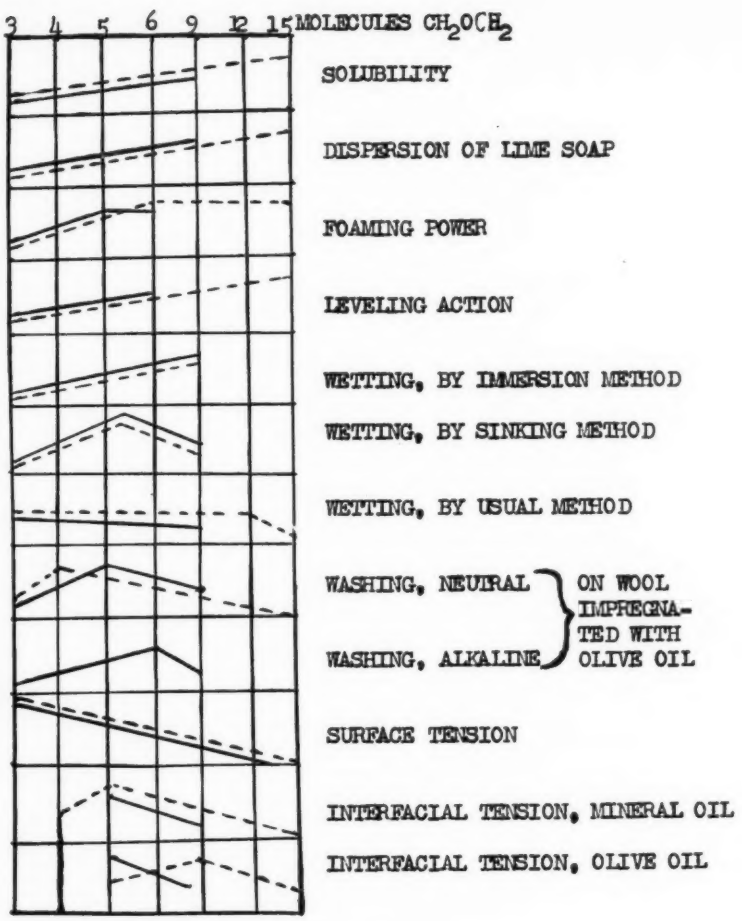

Figure 1

sufficiently different to justify their manufacture.

Isooctylphenol condensed with 6 molecules of ethylene oxide is suitable for wool washing, whereas with 9 molecules a compound is obtained appropriate for leather, and with 10 molecules, the best detergent for cotton of this series. This explains the number of products prepared in this way.

It has been discovered that by sulfation of the terminal OH group of the condensation product, it is possible to obtain several valuable types. One sulfate group is equivalent to 4 molecules of ethylene oxide, which effects an economy of the latter ingredient. By reducing the number of ethoxy groups and substituting the group $O\text{-}SO_3Na$, the foaming properties and solubility at high temperatures are increased. These products are superior for scouring cotton and for fine laundering.

For wool washing, particularly in neutral or acid bath, the non-sulfated types are preferable, as they are substantive to wool like other anion-active compounds.

Another advantage resides in the fact that sulfated products may be prepared in powder form.

Igepal C, a short chain polyethylenic derivative of dodecylphenol and its sulfated derivative, Igepal B, are detergents for cotton superior to anionic detergents and even to oleyl methyl tauride (Igepon T).

This fact is important in laundering and for the elimination of colored pigments in the soaping of printed goods. Products of this type are very good dispersants for lime soaps.

It is interesting to note that certain sub-

stitutes have been discovered to replace those types using natural fats among the products prepared from the alkyl-phenols.

Leonil FFO obtained by condensation of hexyl-heptyl β naphthol with 8 molecules of ethylene oxide may be substituted for Leonil O, which is a condensate of oleic acid with 20 molecules of ethylene oxide.

These products, prepared in 1932 in Germany, are now being made in France, Belgium and America. A table showing the best known products is presented at the end of this article. It is regrettable that the manufacturers do not reveal the exact constitution of their products to the user, as the molecular structure is the only guide to the determination of the range of possibilities of application with certainty.

Uses of Nonionic Compounds in the Textile Industry

Nonionic compounds are principally used in the textile industry for the following purposes:

1.—Wetting Agents.
2.—Washing. (Wool Scouring).
3.—Emulsifying Agents (Oiling of Wool).
4.—Acid Fulling of Cloth.
5.—Dyeing Assistants (Leveling).
6.—Removal of Colors from the Fiber.
7.—Improving the Fastness of Dyeings.
8.—Softening Agents.

1. WETTING AGENTS.—Nonionic compounds are agents which diminish surface tension. They are therefore suitable for all the preliminary treatments in the finishing of textiles as they cause the fabric to be rapidly wet out.

The resistant qualities of these products to chemicals in hot or cold baths offers extensive possibilities. They are very useful products; not only do they disperse lime soaps like the anionic compounds, sulfonates of fatty alcohols, but they possess of themselves powerful lixivial power, not affected by the presence of the metallic salts contained in hard water or in sea water.

Nonionic compounds have no deleterious effect on enzymes between temperatures of 48-51 degrees C, and are thus satisfactory for use in desizing baths. They are used at a concentration of 0.1% to accelerate the wetting and to help the scouring. They are likewise employed in continuous bleaching with peroxides on account of their catalytic action. Practical trials made in the United States on rayon fabrics, using 4 vol. peroxide of hydrogen and 0.1% of these products showed good effects.

2. WASHING.—The process of washing with nonionic compounds was developed by Scholler *(1)*. The action of these nonhydrolizable compounds is altogether different to that of anion active compounds, soaps, sulfonated fatty alcohols, etc.; the nonionic compounds dissolve in water quite easily, but not in the same way as common salt. They are equally soluble in oil, which is important in producing emulsions. In the presence of water they do not form simple solutions, they form combinations known as hydrates.

Crude products of the polyethoxyether of alkylphenol type possess a powerful capacity for combination with water, particularly in the cold. On heating, the solution becomes turbid, heat producing dehydration.

Hydrates poor in water are heavier than water; their solubility is inferior to that of hydrates rich in water.

In a small volume of water, the washing agent separates into very finely divided particles.

An interesting experiment can be made to show this. A solution of Igepal is heated in a test tube in the water bath. Into the upper part of the liquid is inserted a piece of dirty wool. On raising the temperature turbidity is observed in the upper part of the test tube around the wool. The turbidity travels toward the lower part of the tube. After several minutes a separation in layers starts to take place, due to the formation of the heavy hydrate of Igepal. The wool is rapidly cleansed without any agitation of the liquid. It can be determined, by physical and chemical tests, that the upper layer consists of practically pure water. A hydrate of Igepal of unusual viscosity in the lower layer contains all the impurities formerly in the wool. On cooling the tepid solution, a new hydration takes place and a new absorption of water by the Igepal. The two phases and the turbidity disappear. There is formed a new single phase and a homogeneous solution. The process of separation, the emulsification of the soil and its elimination is, therefore, a reversible phenomenon, but, as Igepal is of a non-substantive nature, there is no redeposition of the soil.

This combination of phenomena shows the peculiar properties of the compounds of the polyglycolether type as compared with the usual washing agents and textile assistants.

Wool Scouring: Following the work of Reumuth, the fatty alcohol sulfonates have been recommended for replacing soap in the scouring of wool in the grease. Outside of the price, their affinity for animal fibers often limits their practical use to that of an addition in the last rinse water.

In the scouring of wool in the grease, the effect sought after is degreasing. So one should use a wetting and emulsifying material, soluble in the wool grease, and having no affinity for the fiber, instead of a detergent.

Nonionic compounds have been used in numerous Northern wool-combing establishments, in place of soap.

It is usual to consider each bath in wool scouring as a unit functioning separately. The recommended temperature is 50°C. The first bath contains 45 kilos soda ash in 3800 liters water, the second is charged with 18 kilos soda ash and 1.13 kilos nonionic compound, the third with 1.35 kilos nonionic compound and the fourth with 0.9 kilo. The fifth bath serves for rinsing and contains no addition.

This method has been successfully used in America.

Recent work done by C. A. Norris indicates that the anionic detergents have given deceiving results in wool scouring. He has found that when nonionic compounds are used, it is not necessary to make additions of alkali, except for the purpose of neutralizing free fatty acids, an addition of NaCl being sufficient. The scouring of combed wool oiled with mineral oil required a neutral bath at 40-65°C. containing nonionic detergents and 0.5% NaCl in order to produce an article containing only 0.15-0.3% of grease. Wool goods oiled with oleine ought to be washed first with soda ash then afterwards with a bath containing nonionic detergent with some salt. Raw wool may be treated in a similar manner without addition of soda ash in the second bath. Some interesting results have been obtained by raising the temperature of the first bath to 75°C. and not using soda ash. The technique proposed by Norris is less costly; employment of nonfatty detergents, reduces the amount of soda ash required and produces the wool in good condition and better quality.

A new technique is based on the isoelectric washing of wool.

The isoelectric point is defined as the pH value of an aqueous medium in which a material becomes inactive toward hydrogen and hydroxyl ions and appears to be deprived of its normal reactivity. In this medium, the material shows the greatest resistance to chemical and physical influences. Wool possesses, on account of its protein structure, an amphoteric character. According to the reaction of the medium which surrounds it, wool functions as an acid or a base. The isoelectric point of wool is at pH 4.9. The washing of wool, by means of soap and soda ash takes place in the neighborhood of pH 9.5-10.5. It is evident that the fiber will not withstand this treatment without more or less serious deterioration, according to the conditions of manipulation and temperature.

Frequently a certain amount of felting is encountered, which results in waste, formation of "buttons" or pellets in the last rinse bath and consequent losses in the later operations of spinning.

The isoelectric scouring of wool shows

some interesting results. The sulfonated fatty alcohols formerly recommended have a marked affinity for wool. They are not adapted for the isoelectric scouring of wool in the grease. An ethyl oxide condensation product based on a fat, (Leonil O), originally made to serve as a leveling agent in wool dyeing, has been tried as a scouring agent for raw wool. In the course of these trials, it was found that the fiber could be washed equally well in an neutral bath as in an acid bath. However the temperature was higher than in the case of washing with soap *(2)*.

A new brand, Leonil WS, permits of scouring at normal temperature, 40°C. The nonionic compounds possess to a high degree the colloidal emulsifying properties of soap, but in contradistinction to the anion-active compounds (sulfonated fatty alcohols), they have no affinity for the fiber.

Additions of organic acid are necessary from time to time to control the bath at pH 4.9, on account of variation of composition on the raw wool.

Although it is true that very careful scouring with soap and soda ash has only a very slight tendering action on the fiber, (certain reactions arising from the use of these materials makes them well nigh indispensable) the isoelectric method of wool scouring shows numerous advantages:

1. Easy handling of the fiber.
2. Less swelling, resulting in rapid drying and avoidance of felting.
3. The wool is not yellowed.
4. The wool is obtained in well opened condition, with the natural crimp preserved, it retains its softness and its fresh lofty feel.

Some objection has been raised to this method, notably to the danger of damage to the machinery. By observing the proper precautions it is possible to use existing machinery.

In the course of practical trials which have been made in Germany, in America, and in the north and southwest of France, it has been found possible to conduct this operation almost neutral, that is to say at pH 6, at a temperature of 40-50°C.

The consumption of acetic or formic acid is low and the work is done on conventional types of scouring machines.

The dimensions of the compartments can be reduced, shortening the run of the material. The scouring agent is regenerated by appropriate treatment and returned to the scouring machine, where it receives an addition of fresh scouring agent just sufficient to render it effective. This method has been described by Delaneuvet *(3)*.

There is no question but that a procedure such as that of Norris upsets a little the old routine based on the "Leviathan". The question of price of the nonionic compounds has to be taken into account. It is to be hoped that the manufacturers will be able to supply these products at prices which will permit of the development of this new technique.

3. EMULSIFYING AGENTS.—The products made by condensation of fatty alcohols with ethylene oxide are remarkable emulsifying agents. Emulphor O, introduced in 1932, is an emulsifier of fatty character, possessing good solubility in oleine, water and in organic solvents. It is not affected by acids, alkalies or electrolytes. It possesses high protective colloid properties. In the method used up to the present (emulsification by partial saponification) considerable quantities of fatty acids were necessary to form the emulsion, and were thus deflected from their prime use, particularly in the process of wool oiling. The ethylene oxide condensation products permit utilization of all the oleine used in this process, the emulsifying agent itself having lubricating properties.

Since the appearance of nonionic compounds on the market, the idea of incorporating these emulsifying agents with wool oils has been used in the textile industry. It frequently happens that woven goods contain lubricating oil stains which are difficult to remove during the ordinary sequence of operations. Ringeissen is of the opinion that if this oil is mixed with an emulsifying agent, elimination of the mineral oil would be greatly facilitated. He states that addition of a fatty acid ester of polyethylene glycol soluble in oil to a lubricating oil allows of much better removal of any oil accidentally spattered onto the fabric during manufacture.

In the case of wool, he has found that an addition of 5% of these emulsifying agents, on the weight of the lubricating oil, permits ready elimination of the spots.

It is interesting to note that the addition of emulsifying agents at this concentration does not alter the lubricating properties of the mineral oils with which they are mixed.

Ethylene oxide, a basic component of nonionic synthetic detergents, may be equally well employed for producing emulsifiers of the types of water-in-oil and oil-in-water. Thus, a product of condensation containing 5 molecules of ethylene oxide or less, is soluble in oil and forms water-in-oil emulsions, while with more than 6 molecules a product is obtained which forms oil-in-water emulsions.

The conversion of a water-in-oil emulsion into an oil-in-water emulsion depends on the emulsifying agent and the point of conversion depends on the concentration and the type of emulsifier. By combining nonionic emulsification agents with anion- or cation-active compounds, it is possible to obtain various types of emulsions, substantive or non-substantive toward textile fibers.

Oiling of Wool: The utilization of unsaponifiable compounds, such as mineral oils, has always been considered unsuitable for wool.

Experience proves that it is extremely difficult to remove by scouring. The mineral oil adheres firmly to the wool. This strong adhesion is attributed to the presence of amino-acid chains on the surface of the fiber. The molecules of oil are interlocked between these chains. In spite of their softening and lubricating properties, principally because of the way they are bound to the fiber, wool oiling emulsions having a mineral oil base are only employed for carded wool. The easy elimination of mineral oils is readily effected if the oil exists on the fiber in the form of a homogeneous emulsion. In this state, these emulsions are quickly removed by cold water, because they are present in microscopic trails characteristic of "liquid crystals."

When olein and oils were unobtainable, it was found possible to transform mineral oils into miscible substances, thanks to the use of nonionic compounds as emulsifiers. These compositions equally well removed other impurities (black oil stains) which were frequently acquired during the process of weaving.

These emulsions have been studied by the I.G. following a different technique to that of modern physical chemical methods, even though the latter used spectrographic examination *(4)*. The I.G. studied, by means of moving pictures, the reciprocal action of bodies in contact during the evolution and the conversion of the emulsion.

Since 1905, Stockhausen had on the market a mineral oil emulsion recommended as a lubricant for weaving (Huile a tisser Monopole). The appearance of new artificial fibers and particularly staple rayon fiber at the commencement in Germany of the 4 year plan, brought a veritable revolution in the preparation of oiling preparations for textiles. A study was made of lubricants which were semi-synthetic, in which the mineral oil was mixed with an emulsifier containing partly oleic acid and partly fatty alcohol sulfonate. This required the use of a large amount of emulsifier having an oleic acid base in spinning operations, and resulted in considerable saving of textile soaps in the scouring operation. This did not provide an economy of fatty matters.

It was discovered that the addition of nonionic compounds to mineral oil facilitated scouring. Remarkable progress has been realized in this field in the course of the past few years.

In the spinning of carded wool, the oiling was done almost exclusively with oleine (about 6-10%). In the spinning of combed wool, oiling was done with vegetable oils (1-3%). It was found that certain products, derived from the refin-

ing of spindle oils, served suitably for spinning oils.

Di-isoheptyl-isohexyl-phenol condensed with 7.5-8 molecules of ethylene oxide, Emulphor S.T.S., is used in making mineral oil emulsions in the following proportions:

2 parts Emulphor S.T.S.,

1 part Mineral oil to which has been added 1-2% water; oleic acid is added to this mixture to clarify and stabilize (0.5-2%). The emulsions prepared in this way (Servitol O.L.) show the following advantages:

a. Easier emulsification.
b. Finer dispersion.
c. Work well in neutral or acid bath.
d. Absolute stability to hard water.
e. Easy elimination in scouring.

Wool oils (green shade & red shade)*(5)* prepared in Germany are of this type.

The polyethylene glycols of high molecular weight,

$$HO.CH_2.(CH_2OCH_2)n.CH_2OH,$$

which are in the form of odorless waxes (Carbowax) have been introduced as textile lubricants. The lubrication is excellent and a very few simple rinses are sufficient to remove the last traces of these products from the fiber.

Their esters are also extensively used in America for the preparation of wool oiling compounds.

4. ACID FULLING OF WOOLEN CLOTH.—It is a question whether this vast problem should be taken up here. We know that in acid fulling the action is more rapid and complete; the resultant fabric is more resistant to stretching and more supple. The wool fiber is left in better condition and the cloth is heavier. 4-4.5% sulfuric acid is commonly used, based on the weight of the fabric, which has been well degreased beforehand.

The acid is used in diluted solution for 20 minutes in the dolly washer. It is rinsed, fulled, then rinsed again in hot water. The first rinse water can contain a little soda ash, followed by a thorough rinsing.

Acid fulling is three times as quick as soap fulling, the tensile strength is higher and the elongation to the point of rupture, superior.

The concentration of the acid has an influence on the fulling, the highest strength solution, about 4.5%, give the best results and produce more compact and stronger fabrics. When using solutions containing 6% of acid, the contraction ceases. The resistance to elongation increases up to 8%, falling rapidly thereafter. Acetic, formic and hydrochloric acids do not give as good results as sulfuric acid.

The manufacture of cloths containing spun rayon (staple fiber) present certain difficulties in obtaining the same results as are possible with pure wool. Acid fulling marks a substantial forward step, but its general adoption has been retarded for reasons of machinery.

Sulfuric acid, although economical, cannot be used as it is too risky to use with rayon staple fiber. Organic acids, acetic and formic, on the other hand, can be used in the presence of oiling agents on the fiber, composed of nonionic compounds (Servital O.L.) and the wool oils (red shade & green shade). It is absolutely necessary to use nonionic compounds for acid fulling which have no affinity for wool and are nonhygroscopic.

As a matter of fact, in the acid condition, the fiber combines during fulling with all anion-active compounds including those having sulfo groups. It is sufficient, for example, to leave the material to be fulled in contact with a lubricating agent consisting of olein admixed with a sulfonated fatty alcohol or with oleylmethyl-tauride, to have a deposition on the fiber which can only be removed with difficulty by strong alkaline treatment. The alcoylnaphthalene sulfonates have a still more marked affinity and color the wool quite deeply. These compounds also have a proteolytic action on animal fibers. This does not happen with the nonionic compounds, which are successful in acid fulling. In order to obviate the inconvenience of scouring after fulling, which is sometimes necessary, it has been found that the fulling may be conducted at about pH 7, generally pH 6.5. This effects a saving of organic acid and the removal of the wool oil is generally sufficient. Practical trials have been carried out, but little has been published on this subject, up to the present, in spite of the great interest in this new technique.

5. DYEING ASSISTANTS.—*Vat Dyeing (Leveling Agents)*: Various leveling agents have been proposed to reduce the excessive affinity of certain colors for cotton and rayon, and to assure, in spite of unfavorable conditions, gradual and consequently regular exhaustion of the dyestuff, spent sulfite pulp liquor, glue, etc. It was not always possible to obtain even shades, notably light tints with vat colors of the IN series which are known to have great affinity for the fiber. Cation-active compounds have been proposed with success*(7)*.

Nonionic compounds, such as Peregal O and OK, reduce the affinity to the desired degree.

The mechanism of dyeing with vat colors has been studied and reported in the "Textile Mercury"*(7)*.

When the reduced vat is formed, the color is in a soluble form and the fiber is impregnated with this solution. The size of the particles is such that they are able to penetrate the cellulosic membranes. Equilibrium is established when the number of particles entering and the number of particles leaving the fiber become equal. In reality, the phenomenon is more complex, as the concentration in the interior of the fiber increases the affinity of the cotton for the leuco-derivative. The particles having entered are retained within the fiber and do not seem to be able to follow the reverse road to get out again. One might equally well explain the fact by supposing that the particles having penetrated the interior of the fiber have a tendency to agglomerate. They cannot use the same road to return to the dyebath as the cellular interstices are too small. The dyestuff particles have a tendency to travel in one direction only. When the dyestuff being used has too great an affinity for the fiber, it goes on too quickly, which produces unevelness. The size of the particles may be modified by varying different factors; temperature, alkalinity, and also, according to the observations of Lanzer*(8)*, the time.

Products of condensation of ethylene oxide with fats, of the type of Peregal O, have the property of slowing down the rate of exhaustion of vat colors in the same way as glue, pyridine or long chain compounds.

The action of these agents consists in agglomerating the particles of the leuco derivative which increases its size and makes penetration more difficult. The exhaustion of the color is thus reduced. Excess of these compounds inhibits dyeing altogether.

This action can be regulated by addition of anion-active compounds, sulfonated fatty alcohols, which increase the affinity, or dispersing agents (e.g. sodium dinaphthylmethane disulfonate) which put the particles into a dispersed form increasing the faculty of penetration. This latter technique is found useful in the dyeing of rayon in cake-form.

Variation in the degree of dispersion of particles of leuco-derivatives has been investigated by Walko*(9)* in 1935. This author measured the speed of transfusion across porous plates of Brilliant Indanthrene Green FFB in the leuco form, with additions of leveling agents. The remarkable action of Peregal O is shown in Table I.

The agglomeration of the particles under the influence of this product is manifest. It shows itself by a slowing down of the rate of dyeing, which favors even dyeing.

TABLE I

	Coefficient of Diffusion	*Radius of Particles*	*Molecular Weight of Particles*	*Degree of Aggregation*
No addition	0.2730	7.7 x 10^{-8}cm.	1,700	3
Peregal O	0.0539	38.8 x 10^{-8}cm.	220,000	420

The slowing down properties of Peregal O show themselves also in dyeing with direct colors and basic colors on cotton and viscose, likewise in silk and acetate dyeing. An important study on this subject has been published by G. Schwen*(10)*.

The Société Rhodiaseta has recently found that addition of a small quantity of Celmulsol B to acetate dyebaths improves the evenness of acetate rayon dyed on the package machine.

6. STRIPPING OF DYED COLORS.—The process of stripping is used for various purposes; sometimes to lighten the shade, sometimes to remedy uneven dyeing, and sometimes to dye another shade on the material. Certain dyestuffs, particularly the insoluble azos and vat dyes, are difficult to strip satisfactorily, even at the temperature of boiling. It has been proposed to use Leucotrope W, which is used with certain colors in discharge printing.

Some colors, such as Indanthrene Blues and Violets, are not completely strippable. The stripping bath is very alkaline. In certain cases stripping agents which react in a neutral or weakly acid bath are preferred: Rongeol C (sodium sulfoxylate formaldehyde). No matter what reducing agent is employed, the stripping is hindered by reoxidation of the leuco derivative during rinsing. Certain assistants added to the stripping bath tend to inhibit this reaction; salts of magnesia, glue, spent cellulose sulfite liquors, etc.

The stripping may be increased by using nonionic compounds of the type of Peregal O. During the stripping operation, the phenomenon of aggregation of the particles, to which reference has been made, takes place in a more intense manner by using 4-5 times the quantities of the leveling agents used in dyeing. The insoluble particles of dyestuff are reduced in the interior of the fiber. They become soluble by formation of the leuco derivative and a certain proportion emerge from the substance of the fiber and are diffused in the bath. A considerable proportion of the leuco derivative is retained by the fiber. When the concentration of the bath attains a certain value, the same condition obtains as was mentioned in the case of dyeing. Products of the nature of Peregal O and OK, which have the property of causing agglomeration of the particles withdrawn from the fiber, prevent the return of the leuco compound to the fiber. By regulating the dosage of the assistant, it is possible to substantially reduce the color. Addition of magnesium salts limits re-oxidation during stripping and rinsing*(11)*.

7. IMPROVEMENT OF FASTNESS OF DYED COLORS.—Condensation products of ethylene oxide with fatty bodies having good emulsifying and detergent characteristics are useful in maintaining in colloidal suspension the color lake which arises from mechanical deposition of the insoluble azo colors on the fiber.

This lake is formed in the dyebath or on the fabric itself without being actually fixed. For this purpose naphthalene sulfonic acid 1,3,6 is used (Paradurol).

In the newer methods the condensation products of ethylene oxide and fatty alcohols are used.

Treatment with boiling soap (8 grams per liter) is eliminated, as the loose color lake formed in the dyebath and on the surface of the fiber is dispersed. The colloidal suspension of coloring matter formed is stable; it does not redeposit on the fiber and is eliminated during rinsing. A notable improvement in fastness to rubbing is obtained both in tub and in package dyeing. The assistant stabilizes the azoic dyebath. The insoluble excess color is maintained in colloidal solution and does not produce stains on the goods.

8. SOFTENING AGENTS.—The softening of textile fibers is accomplished by the use of sulfonated fatty alcohols, emulsions of fats or fatty alcohols with anionic compounds, the quantities of which are determined according to the effect desired: touch, softness, suppleness, etc.

The fatty acid esters and the esters of polyethylene glycol have acquired considerable importance in the softening of rayon. It is possible to obtain products of a substantive character to improve the handle of artificial fibers, by use of these esters with cation-active compounds, salts of fatty amines, fatty oxyethylamides or quaternary ammonium bases.

Nonionic compounds made by oxyethylation of fatty alcohols (lauryl, cetyl, stearyl) not having affinity for the fibers, are not specifically the products for softening.

Scrooping or semi-scrooping of rayon is difficult to produce. A mixture known as the "deux huiles" is used or sulfonated peanut oil used in a special manner.

The effect of scroop or semi-scroop on viscose goods is obtained in an altogether unexpected way by using nonionic compounds to emulsify fatty alcohols of corresponding molecular weight. About 30% emulsifier is used with 70% fatty alcohol, with a small quantity of organic solvent at times, such as spirit of turpentine, likewise some paraffin or wax to thicken the paste. The emulsion is used at the rate of 2-3 grams per liter at 40-50°C. for finishing millinery goods, hosiery, knit goods or rayon filament or staple.

This rapid survey reveals the extent of the domain of application of nonionic compounds. Mannufacturers of textile auxiliaries are interested in this subject and there is no doubt they will cooperate in the development of this new technique.

Index on Nonionic Compounds

I—Products obtained by autocondensation of ethylene oxide (C_2H_4O)

Carbowax 1500	CCC	Polyethylene glycol M.W. 1500	Wax	S	Wool oiling Lubricant Plasticizer
Carbowax 4000	CCC	Polyethylene glycol M.W. 4000	Wax	S	idem
Conolines	CPE	Polyethylene glycols	Liq.	D	Finishing agents
			Wax	S	Softeners
Emulphor O.N.	G	Polyethylene glycol	Wax	S	Emulsifier
Igepal C.E.	IG	Ethylene oxide condensed & polymerized	Liq.	S	Emulsifier Dispersant
Polyglycols 1500, 2000	Croda	Polyethylene glycols	Liq.	S	idem
			Wax		
Proxolene 600, 1500, 2000	Ku	Polyethylene glycols	Paste	S	Dispersant, Lubricant, Softener

II—Products obtained by condensation of fats or their derivatives with ethylene oxide.

II-A—Derivatives of fatty acids or their esters

Advawet 33	ASC	Esters of fatty acids cond. with C_2H_4O	Liq.	S	Emulsifier, Dispersing pigments
Atlas 2000	APCo	Mannitan monopalmitate cond. with C_2H_4O	Semi solid	S	Emulsifier Softener
Atlas G 1036	APCo	Sorbitol monostearate cond. with C_2H_4O	Paste	S	idem
Belgaviv SG	Belgo tex	Stearic acid condensed with ethylene oxide	Paste	D	Softener
Belsam III	UCB	Fatty acid condensed with ethylene oxide	Paste	S	Oiling Viscose Finishing
Cemulsol A	CPE	like Emulphor A	Oil	D	For making Wool & Spinning Oils
Cemulsol B	CPE	like Emulphor EL	Oil	S	idem
Cerfak 1300	Houghton	Fatty acid esters & Polyethylene glycol	Paste	S	Detergent for Wool & Cotton
Clavanol	Dexter	idem	Paste	S	Emulsifier

Crillex 1-13	Croda	Polyethoxyesters of fatty acids	Paste & Wax	S	Emulsifiers
Chillex 17 & 19	Croda	Monostearate of propylene glycol* C_2H_4O	Soft Waxes	S	Emulsifiers
Crillex 20-23	Croda	Polyethoxyesters of Stearic acid	Soft Waxes	S	Emulsifiers
Demal 14		Fatty acid ester and polyethylene glycol	Oil	S	Dispersant Humectant
Edunine ON	F	Stearic acid condensed with hexaglycol	Paste	D	Softener for rayon
Emulgabel Extra	Belgatex	Similar to Emulphor A	Liq.	S D	Emulsifier for Wool oils
Emulgane OP	D	Polyethoxyester of fatty acid	Opaq. Liq.	S D	Emulsifier for Wool oils
Emulphor A	I.G.	Oleic acid condensed with 6 mol. C_2H_4O	Liq.	S D	Emulsifier
Emulphor AG	I.G.	as Emulphor A but with C.P. Oleic acid	Liq. Liq.	S D	Emulsifier
Emulphor EL	I.G.	Castor oil condensed with 20-40 mol. C_2H_4O	Liq.	D	Emulsifier
Emulsifier 0205	JWC	Polyethoxyester of fatty acid	Liq.	D	Emulsifier
Emulsov A	Sovilo	Similar to Emulphor A	Liq.	S	Emulsifier for Mineral oils
Emulsov O	Sovilo	Polyethoxyester of castor oil fatty acids	Liq.	S	Emulsifier for Oleine, vegetable and animal oils
Emultex S	A	Similar to Emulphor EL	Oil	S D	Emulsifier
Ethofats	Armour	Nonionic compounds made from Neofats	Paste	S	Detergents Emulsifiers
Formulas L34A, L32, L45	JWC	Fatty acids condensed with polyethylene glycols, M.W. 1500-4000	Paste	S	Emulsifiers
Glucaid		Polyethoxyester of fatty acids	Oil	S	Dyeing assistant
Hymolon R 31	Hart	Polyethoxyester of fatty acids	Oil	S	Wetting agent
Hymotol	Hart	Polyethoxyester of fatty acids	Oil	S	Leveling agent Emulsifier
Intral 222, 231, 233	Syn.	Polyethoxyester of fatty acids	Oil	S	Wetting, Dispersing Emulsifier
Irgamine E	Gy.	Similar, Soromine SG	Paste	D	Softener
Lauramyl 776	D	Polyethoxyester of fatty acids of medium molecular weight	Paste	S	Emulsifier Detergent Scouring agent
Mulsor	Syn.	Polyethoxyester of fatty acids	Liq.	S	Emulsifier for mineral oils
Neutronyx 330, 331, 332, 333, 334	Onyx	Polyethoxyester of fatty acids	Liq.	S	Detergents Scouring agents
Non-ionic LD	Emulsol	Polyethoxyester of fatty acids	Liq.	D	Detergent Wetting
Non-ionic IG	Emulsol	Polyethoxyester of fatty acids	Wax	D	Detergent
Nonisol 150, 210, 250, 350..	Alro.	Polyethoxyester of fatty acids	Paste or Oil	S D	Emulsifiers Solvents
Nopalcols	Nat-Oil	Polyethoxyester of fatty acids	Paste or Oil	S D	Emulsifiers
Quakesters	Quaker	Polyethoxyester of fatty acids	Paste or Oil	S D	Emulsifiers Detergents
Remolgan A	I.G.	same as Emulphor A	Paste	S	Wetting agent for leather and furs
Renex	APCo	Fatty acid esters condensed with polyglycols	Paste	S	Detergents
S 1005 & 1010	GPC	Monooleate of polyethylene glycol	Paste	S	Wetting agent
S 1013	GPC	Monolaurate of polyethylene	Paste	S	Wetting agent
Soromine SG	I.G.	Stearic acid condensed with 6 mol. C_2H_4O	Paste	D	Rayon finishing
Spirazol S	ATB	Product of oxyethylation of fats	Paste	S	Emulsifier
Stearamines S & D	D	Polyethoxy esters of fatty acids	Paste	S	Rayon finishing
Telkanol	Dexter	Polyethoxy esters of fatty acids	Paste	S	Penetration in dyeing
Tween 20	APCo	Monolaurate of sorbitan condensed with C_2H_4O	Liq.	S	Emulsifier
Tween 40	APCo	Sorbitan monopalmitate condensed with C_2H_4O	Paste	S	Emulsifier
Tween 60	APCo	Sorbitan monostearate condensed with C_2H_4O	Liq.	S	Emulsifier
Tween 61	APCo	Similar to Tween 60	Wax	S	Emulsifier
Tween 80	APCo	Sorbitan mono-oleate condensed with C_2H_4O	Liq.	S	Emulsifier
Tween 81	APCo	Similar to Tween 80	Liq.	D	Emulsifier
Tween 85	APCo	Sorbitan trioleate condensed with C_2H_4O	Paste	D	Emulsifier
Vanade-Vanite		Polyethoxy ester of sorbitan stearate		S	Emulsifier

II-B—Derivatives of fatty alcohol.

Astorit	BFC	Similar to Peregal O	Liq.	S	Leveling agent
Cutex OAS	Belgotex	Similar to Emulphor O	Liq.	S	Emulsifier
Despephor	DSP	Alcohol acetic ester condensed with C_2H_4O	Wax	S	Emulsifier
Diazolite N	UCB	Similar to Diazopon A	Liq.	S	Stabilizer for Azoic dyebaths
Diazolo	ACNA	Similar to Diazopon A	Liq.	S	Stabilizer for Azoic dyebaths
Diazopon A	I.G.	Aqueous solution of Emulphor O.	Liq.	S	Stabilizer for Azoic dyebaths
Diazopon AN	G	Aqueous solution of Emulphor O.	Liq.	S	Stabilizer for Azoic dyebaths
Diazotex O	F	Polyethoxyether of a fatty alcohol	Liq.	S	Stabilizer for Azoic dyebaths
Dispersol E	ACNA	Similar to Emulphor O	Wax	S	Stabilizer for Azoic dyebaths
Egalex	A	Similar to Leonil O	Liq.	S	Scouring and simultaneous dyeing
Eganolo P	ACNA	Similar to Peregal O	Liq.	S	Leveling agent
Emulphor O	I.G.	Oleyl alcohol cond. with 20 mol. C_2H_4O	Wax	S	Emulsifier
Emulphor O, and O^2	Sinnova	Similar to Emulphor O	Wax	S	Emulsifier
Emulphor OL	I.G.	Abietyl alcohol cond. with C_2H_4O	Liq.	S	Emulsifier for Olein
Enretex OAG	Belgotex	Polyethoxyether of a fatty alcohol	Liq.	S	Leveling agent for dyeing
Fast Palatine Salt O	I.G.	Aqueous solution of Emulphor O	Liq.	S	Scouring with simultaneous dyeing
Floex		Polyethoxyether of fatty alcohols	Liq.	S	Wetting agent Dispersant
Glim G		Polyethoxyether of a fatty alcohol	Liq.	S	Laundry detergent
Lategal	UCB	Similar to Peregal O	Liq.	S	Leveling agent in dyeing
Leonil C	I.G.	Lauryl alcohol cond. with 9 mol. C_2H_4O	Liq.	S	Leveling agent Detergent
Leonil O, OS	I.G.	Oleyl alcohol cond. with 20 mol. C_2H_4O	Liq.	S	Dyeing assistant with simultaneous scouring
Lissapol N	ICI	Polyethoxyether of fatty alcohols	Paste	S	Detergent Scouring agent

Orapol 100	PCMN	Polyethoxyether of fatty alcohols	Liq.	S	Detergent Scouring agent
Peraltex	A	Similar to Peregal O	Liq.	S	Leveling agent
Peregal O	I.G.	Aqueous solution of Emulphor O	Liq.	S	Leveling agent
Sel Inochrome O	F	Solution of a Polyethoxyether of a fatty alcohol	Liq.	S	Washing asst. Dyeing assistant
Solifix TN	Sinnova	Similar to Diazopon A	Liq.	S	Stabilizer for dyeing azoic colors
Sunaptol O	F	Polyethoxyether of technical lauryl alc.	Liq.	S	Emulsifier Scouring agent
Ucepal CO, 30	UCB	Polyethoxyether of a fatty alcohol	Liq.	S	Wool scouring
Unigal TU	Sinnova	Similar to Peregal O	Liq.	S	Leveling agent
		II-C—Derivatives of fatty amide.			
Alrosols	Alro	Oxyethylamides of fatty acide cond. with C_2H_4O		S	Detergents
Cerfak NIOO	Hought,	Oxyethylamides of fatty acids cond. with C_2H_4O		S	Detergents
D.O.M.B.	Hoechst	Dioctadecylethanolamide cond, with 15 mol. C_2H_4O		S	Emulsifier
Emulgane CT	D	Oxyethylamide of fatty acid cond. with C_2H_4O	Liq.	S	Emulsifier
Emullat O	UCB	Oxyethylamide of fatty acid cond, with C_2H_4O	Oil	S oil	Emulsifier
Emulphor FM sol. in oil	I.G.	Triethanolamine oleate	Oil	S oil	Emulsifier
Ethomids	Armour	Fatty amides condensed with C_2H_4O		S	Detergents Emulsifiers
Non-ionic OD100	Emulso	Fatty amides condensed with an alcoylene oxide	Paste	D	Wetting agent Detergent
Soromine AF	I.G.	Stearyldiethanolamide cond. with 2 mol. C_2H_4O	Paste	D	Softener
		II-D—DERIVATIVES OF FATTY AMINES			
Peregal OK	I.G.	Oleylamine condensed with 6 mols. C_2H_4O plus a cation-active compound plus Oleyl sarcoside	Liq.	S	Leveling agent
		II-D—Unclassified			
Persistol WS	I.G.	n-octadecyl nn'ethylene imide cond with C_4H_2O	Paste	D	Water repellent for rayon
Polymine P	I.G.	Product of polymerization of ethylene imine		S	Paper-making
Sterox	MCC			S	Domestic washing
		III—Products obtained by condensation of alkylaryl compounds with ethylene oxide			
		III-A—Derivatives of alkylphenols			
Dismulgan III	I.G.	Dodecylphenol cond. with 3 mols. C_2H_4O	Liq. thick	S	Demulsification
Emulphor A ext.	I.G.	Di(isoheptyl isohexyl) phenol condensed with 6.5 mols. C_2H_4O	Oil	S oil	Emulsifier
Emulphor ELN	I.G.	Mixture of 85 parts of di(isoheptyl isohexyl) phenol condensed with 20 mols. C_2H_4O and 15 parts of water	Oil	S	Emulsifier for oleine and for softening
Emulphor MW	I.G.	Di(isoheptyl isohexyl) phenol condensed with 7.5-8 mols. C_2H_4O plus 0.5% synthetic fatty acid.	Oil	S oil	Emulsifier for mineral oil
Emulphor STS	I.G.	Di(isoheptyl isohexyl) phenol condensed with 1.5 mols. C_2H_4O	Oil	S oil	Emulsifier
Igepal C conc.	I.G.	Dodecylphenol cond. with 12 mols. C_2H_4O	Liq.	S	Detergent Wetting agent
Igepal CTA	I.G.	Dodecylphenol cond. with 12 mols. C_2H_4O	Liq.	S	Detergent Wetting agent
Igepal F	I.G.	Isooctylphenol con. with 9 mols. C_2H_4O	Liq.	S	Scouring agent for animal fiber and feathers
Igepal W	I.G.	Isododecylphenol cond, with 6 mols. C_2H_4O	Liq. thick	S	Detergent for wool and union fabrics
Leonil WS	I.G.	Alkylphenol cond. with a polyglycol	Liq. thick	S	Scouring agent for wool
M 885	DPM	Isooctylphenol cond. with C_2H_4O	Liq.	S	Emulsifier Dispersant
Triton NE	RH	Alkylphenol cond. with C_2H_4O (3 ethoxy groups)	Liq.	S	Wetting agent Detergent
		III-B—Derivatives of alkylnaphtols			
Emulphor FFO	I.G.	Hexylheptyl β naphtol cond. with 9 mols. C_2H_4O	Liq. thick	S	Emulsifier
Leonil FFO	I.G.	Hexylheptyl β naphtol cond. with 9 mols. C_2H_4O	Liq. thick	S	Washing and wool scouring
Lupon	I.G.	Hexylheptyl β naphtol cond. with 8 mols. C_2H_4O	Liq. thick	S	Detergent
		Derivatives of the preceding classes, sulfated and sulfonated			
Alipal CL		Alkylphenol cond. w. 3 mols. C_2H_4O and sulfated	Paste	S	Laundry detergent
Alipal D		Di(isohexylisopheptyl) phenol condensed with 4 mols. C_2H_4O and sulfated	Paste	S	Laundry detergent
Detersive J3R	I.G.	Fatty acid oxyethylamide from Colza Oil condensed with 3 mol. C_2H_4O and sulfonated	Pdr.	S	Washing and cleansing agent for wool, rayon and cotton
Detersive L46	I.G.	Hexylheptyl naphthol condensed with 4 mols C_2H_4O and sulfonated on chain terminal		S	Laundry detergent
Igepal B	I.G.	Di(isohexyl-isoheptyl) phenol condensed with 5 mols. C_2H_4O and sulfonated	Paste	S	Detergent for textiles
Leonil LS	I.G.	Similar to Detersive L46			Detergent
Triton 720	R.H.	Alkylphenol condensed with C_2H_4O and sulfonated	Paste	S	Wetting agent Detergent
Triton 770	R.H.	Alkylphenol condensed with C_2H_4O and sulfonated	Paste	S	Wetting agent Detergent

Mixtures of non-ionic compounds with various additives

Emulphor FFH	I.G.	Emulphor FFO plus anionic compound	Liq. thick	S Emulsifier
Wool oil red shade	I.G.	Emulphor STS plus mineral oil	Liq.	D Oiling wool
Wool oil green shade	I.G.	Emulphor STS plus mineral oil	Liq.	D Oiling wool
Hexambearol OT	Sinnova	Emulphor O plus solvent	Liq.	S Washing and Scouring agent
Igepal CM	I.G.	Igepal C plus Mersolat D	Liq.	S Detergent
Igepal L	I.G.	Igepal W plus Intra solvent	Liq.	S Detergent
Igepal M	I.G.	Igepal plus Mersolat D	Liq.	S Detergent
Lubral R.V.	Sinnova	Emulphor O plus mineral oil	Liq.	D Oiling rayon
Servital AC conc.	I.G.	Servital OM plus DOMB	Liq.	D Oiling rayon
MXP	MCC	Nonionic compound plus additional detergents	Pdr.	S Laundry detergent
Servital OL conc.	I.G.	Emulphor STS plus mineral oil	Liq.	D Oiling rayon
Servital Reissol blue shade	I.G.	Emulphor A extra plus mineral oil	Liq.	D Oiling rayon
Soromine D	I.G.	Polyesters of fatty acid of suet plus Igepal	Liq.	D Softener
Uniperol A	I.G.	Igepal plus anionic compound	Liq.	S Leveling agent for dyeing

List of Manufacturers

A	Adjubel S. A.	Brussels, Belgium
ACNA	Azienda Colori Nazionali Affini	Milan, Italy
ALRO	Alrose Chemical Co.	Providence, R. I., U. S. A.
APCo	Atlas Powder Co.	Wilmington, Del., U. S. A.
Armour	Armour & Co.	Chicago, Ill., U. S. A.
ASC	Advance Solvents Co.	New York, N. Y., U. S. A.
Belgotex	S. A. Belgotex	Brussels, Belgium
BFC	Bohme Fett Chemie et Produits de la Mer Rouge	Mulhouse, France
CCC	Carbide & Carbon Chemicals Co.	New York, N. Y., U. S. A.
CPE	Consortium de Produits Chimiques et d'Entretien	Bezons, France
Croda	Croda, Ltd.	Gople, England
D	Etablissements Doittau (Solar)	Corbeil, France
Dexter	Dexter Chemical Co.	New York, N. Y., U. S. A.
DSP	Etablissements Despe	Haat, Belgium
Emulsol	Emulsol Co.	Chicago, Ill., U. S. A.
F		
G	General Dyestuff Corporation	New York, N. Y., U. S. A.
GPC	Glyco Products Co.	New York, N. Y., U. S. A.
Gy	J. R. Geigy Co.	Basel, Switzerland
Hart	Hart Products Co.	New York, N Y., U. S. A.
Houghton	E. F. Houghton & Co.	Philadelphia, Pa., U. S. A.
JWC	Jacques Wolf & Co.	Passaic, N. J., U. S. A.
ICI	Imperial Chemical Industries	London, England
I.G.	I. G. Farben Industrie	Ludwigshafen, Germany
Ku	Etablissements Kuhlmann	Paris, France
M.C.C.	Monsanto Chemical Co.	New York, N. Y., U. S. A.
Nat-oil	Nopco Chemical Co.	Harrison, N. J., U. S. A.
Onyx	Onyx Oil & Chemical Co.	Jersey City, N. J., U. S. A.
PCMN	Produits Chimiques de la Montagne Noire	Castres, France
Quaker	Quaker Products Co.	Conshohocken, Pa., U. S. A.
R.H.	Rohm & Haas Co.	Philadelphia, Pa., U. S. A.
Sinnova	Société Sinnova	Neuilly, France
Sovilo	Etablissements Sovilo	Paris, France
Syn	Synthetic Chemicals	Paterson, N. J., U. S. A.
UCB	Union Chimique Belge	Brussels, Belgium

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• PATENT DIGEST •

PAUL WENGRAF

Water Repellent Fabrics—Zirconium Compounds Decomposed at Elevated Temperatures G, 2, 02

U. S. Pat. 2,457,853
(National Lead Company, Van Mater, January 4, 1949)

It has been suggested to render textiles water repellent by incorporating zirconium soaps. Generally the textiles were treated with soluble zirconium salts, as the present specification states, and the insoluble zirconium soaps were obtained by a subsequent immersion in a soap solution. This two-bath process has the drawback of tendering the cloth by the strong acidic reaction of the soluble zirconium mineral acid salts. Furthermore these finishes are not sufficiently durable because the fatty acids, linked to zirconium, are easily removed in any soap solution. The patent suggests the preparation first of a water-soluble double carbonate of zirconium by reacting the mineral acid salt with an alkali or ammonium carbonate, for example:

$$ZrO\,SO_4 \cdot H_2SO_4 \cdot 3\,H_2O + 3(NH_4)_2\,CO_3 + aq. \rightarrow ZrOCO_3 \cdot (NH_4)_2\,CO_3 + 2(NH_4)_2\,SO_4 + CO_2 + aq.$$

The double salt (zirconium-ammonium carbonate) is water soluble at room temperature but decomposes rapidly at 60°C. and above. The treating solution is prepared by mixing an amount of soluble soap with the double carbonate; a colloidal solution results which keeps for several hours. By heating the impregnated fabric (thus double salt plus soap, for instance, oleic acid soap) the zirconium double salt is subsequently transformed into zirconyl mono oleate, $Zr.O(OH) \cdot C_{17}H_{33}CO_2$, while ammonia and CO_2 evaporate. The water soluble salts resulting as by-products are thereupon removed by washing. The addition of salts is recommended, which tend to form *supersaturated solutions* (sodium sulfate or acetate); in contrast to this type of salts sodium chloride is known to salt out colloids.

References cited by the Patent Office, among others:

U. S. Pat. 2,328,431 (Gen. Aniline): water repellent preparations containing paraffin, zirconium oxychloride and emulsifier of the "Emulphor" type.

U. S. Pat. 2,289,316 (Resinous Products): emulsions of water insoluble metal soaps with alkyl-aryl oxy acetates (example: caprylphenoxy acetate) as water repellent agents.

U. S. Pat. 2,252,658 (Plaskon Comp.): preparing zirconium solutions or the like by adding barium hydroxide, barium sulfide or another water-soluble barium salt to zirconium sulfate and mixing this composition with a water soluble soap.

U. S. Pat. 2,221,975 (Titanium Alloy): pigments are obtained by melting stearic acid and mixing it with water insoluble

zirconium salts + caustic soda, neutralizing dropwise in the cold, whereby a dry powder results.

For other references compare abstracts to U. S. Pat. 2,402,857 (Titanium Alloy) REPORTER 1946, 719, and U. S. Pat. 2,455,886 (Sayles Fin. Plant), REPORTER 1949, 325.

Delustering Nylon—Antimony Compounds Used F, 3, 02

Brit. P. 609 257
(Tootal Broadhurst Lee Co., Foulds-Roscoe, October 1948)

Delustered effects on nylon are produced by bringing it into contact with solutions of antimony trichloride in hydrochloric acid so that the proportion of free HCl is from 10-20%. Preferably the $SbCl_3$ solutions are prepared by dissolving antimony oxide in aqueous hydrochloric acid of at least 15% concentration so that this solution contains a maximum amount of $SbCl_3$, having an acidity of less than 12%. A table shows the proportions of HCl to Sb_2O_3 necessary for obtaining the concentrated antimony cluoride solutions—higher quantities of Sb_2O_3 have only the effect of forming SbOCl. Nylon is treated with one of these solutions and then immersed in water to precipitate on the fiber small particles of antimony trioxide which adheres firmly and gives a delustering effect. Dilute solutions have to be for relatively longer times in contact with the fibrous material. It is convenient to adjust the solution in such a way that this treatment requires between five seconds and five minutes. According to an example an antimony-chloride solution brought up with free HCl to give an acidity of 10% is prepared and nylon is dipped for one minute in this liquid, squeezed out between pad rollers and thereupon treated with cold water, and finally neutralized. The fabric was uniformly delustered and could be dyed thereafter. Resists showing lustrous patterns on delustered ground could easily be obtained by printing with an acid resisting paste.

Reference:

Up to now delustering with antimony compounds has not been suggested as far as can be found from prior publications. A special delustering composition for nylon has been proposed in Brit. P. 574,785 (REPORTER 1946, 399, Imp. Chem. Ind.). The composition consisted of lithium-copper- or zinc salts dispersed in lower alcohols.

Shrinkproofing Wool—Hypochlorite in Concentrated Solutions A, 2, 04

U. S. Pat. 2, 465 695
(Harris Research Labor., Fishman-Harris, April 12, 1949)

The object of the present patent is to make wool material shrinkproof without affecting the strength, color, feel and other properties of the fabrics. It had formerly been suggested by Harris and co-workers (see REPORTER 1949, 326, U. S. Pat. 2,457,033) to treat woolen goods with hypochlorite solutions, buffered at pH = 7.5 — 9. The present invention can be considered as a further development of this method: the chlorine solutions are of a *relatively high strength,* having 1%-6% available chlorine, while the time of the reaction is restricted to a maximum of 60 seconds. Immediately thereupon the excess chlorine has to be eliminated either by sodium bisulfite or another antichlor. Part of the invention is the simultaneous use of wetting agents which obviously have to be resistant to oxidizing agents. The specification mentions here "Tergitol 4" (sulfuric acid esters of higher secondary alcohols), "Tween 20" (fatty acid esters of polyhydric alcohols) and "Tetranol" (sulfated fatty esters). According to one of the examples, a solution, containing 3% available chlorine, buffered at pH = 8.5, plus 0.8% Tergitol 4 is used to impregnate white flannel shirting in a padding machine at 20°C. The material is left for only 2-3 seconds in contact with this solution, squeezed and directly led through a 1% sodium bisulfite solution, subsequently rinsed in running cold water and dried. The untreated fabric shrunk 39% in an accelerated laundering test while the shrinkage of the fabrics, treated according to the patented process, was reduced to 1%.

References cited by the Patent Office, among others:

U. S. Pat. 2,395,724 (Tootal Broadhurst Lee): the tendency of wool to shrink is reduced by treating it with synthetic resins and one or more anti-felting agents such as hypochlorite, chlorine or bromine.

U. S. Pat. 1,781,415, 1930 (Smith and Ruby): wool is treated with non-acidic, i.e., neutral or alkaline hypochlorite solutions. The *hydroxylion concentration* is limited to 10^{-3} to 10^{-5}.

Brit. P. 557,600 (Clayton and Edwards): covering the "Negafel" process, comprises a chlorinating process, starting with slightly alkaline hypochlorite solutions, gradually neutralized by adding solid carbondioxide.

For other reperences see U. S. Pat. 2,457,033, REPORTER 1949, 326.

None of the known references suggested using highly concentrated hypochlorite solutions under the specific conditions mentioned here above.

Printing Indigosols—Adding Alkyl Aromatic Sulfonates D, 2, 04

U. S. Pat. 2,466,656
(Am. Cyanamid, W. B. Hardy-E. M. Hardy, April 5, 1949)

Several Indigosol brands which are difficult to oxydize and do not develop for this reason to full strength, cannot be used in the otherwise frequently applied method of incorporating dichromate in the printing paste and ageing the goods in acetic-formic acid vapors. Even drastic increases of the ageing time (up to 20 min.) do not bring about the full color yield. Another drawback experienced with this type of Indigosol dye is that the color development sometimes continues in after-storage so that irregular results frequently occur. The object of the present invention is to effect full oxydation, even in using difficultly oxydizable Indigosol brands, by applying the forementioned dichromate-acid vapor method. It has been found that some substances, containing substituted hydroxy-aromatic sulfonates, act here as *accelerators.* Examples of these accelerators are water soluble salts of naphthol sulfonic acids, naphthol disulfonic acids, resorcinol sulfonic acids and substituted naphthalene compounds in which the sulfonic acid group is not linked to the aromatic nucleus but to a side chain (e.g. 2-OH-2 methyl-naphthalene-omega sulfonic acid). It is emphasized that these sulfonates are not efficient in catalytic traces but in rather large amounts only, which are somewhat less than the weight of the dyestuff and the oxydizing agent present in the paste. The process protected by the patent is further limited to the dichromate-acid vapor process and should not be confused with the developing method by passing through nitrite or dichromate *solutions.* Examples mentioned in the specification as difficultly oxydizable dyes are the Indigosols of tetra bromo indigo. (Indigosol 04B), of dibenzothio indigo (Indigosol Brown IRRD) and dichloro dimethyl thioindigo (Indigosol Red Violet).

References cited by the Patent Office:

U. S. Pat. 2,234,301 (Durand-Huguenin-Niederhäusern): Indigosols are developed by acid oxydation in the presence of a protective substance, easily convertible by oxydation into a quinone (examples hydroquinone, pyrocatechol).

Other reference:

U. S. Pat. 2,029,351 (also Brit. P. 421,606, Imp. Chem. Ind.): suggests adding dibenzylsulfanilate of sodium to improve the color yield of Indigosols, for example Indigosol Brown RRD.

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Meeting: November 5 (Charlotte Hotel, Charlotte, N. C.

HUDSON-MOHAWK SECTION

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Meetings: Sept. 9, Dec. 9.

RESEARCH COMMITTEE

Meetings: Sept. 9, Dec. 9.

NATIONAL CONVENTIONS

1949: October 13 to 15, Chalfonte-Haddon Hall. Atlantic City.

1950: Portsmouth, N. H.

1951: October 18 to 20, Statler, New York.

Research Highlights

COLOR NOMENCLATURE. — A.A.T.C.C. and Society of Dyers and Colourists have, after more than two years' discussion, agreed on color nomenclature to be used in the new edition of the *Colour Index*. Briefly, dyes in the new *Colour Index* will be described by use of one of 88 permissible "trivial color names." The range of colors which fall in each classification will be exactly defined in terms of a standard color system such as the ISCC-NBS System. Some of the boundaries will be illustrated by a color chart containing 51 swatches. At present it is not planned to include any spectrophotometric curves in the *Colour Index*.

COLOR MEASURING INSTRUMENTS.—The problem of evaluating the relative merits of the several new color measuring instruments has been considered by an A.A.T.C.C. Committee. While not undertaking a comprehensive study it does plan to evaluate data as they become available from other studies.

EDUCATIONAL COMMITTEE.—The A.A.T.C.C. Executive Committee on Research has responded to a request that a committee be formed from the general membership composed of practical mill men and educators, who will draw up suggested programs of study for the use of educational institutions should they desire to avail themselves of the recommendations.

It is the feeling of not only practical men, but of educators giving textile courses or courses pertaining to textile processing, that the present curricula in some cases are subject to improvement to assure a good foundation for a student going into textile processing.

EMPLOYMENT REGISTER

This column is open for four insertions per year, per member, without charge. Blanks can be obtained from, and filed with, the Secretary of the Association, Lowell Textile Institute, Lowell, Mass. It is understood that these will be open to inspection by prospective employers, who can obtain further information from the Secretary.

49-12

Education: Pratt Institute, and City College of New York, chemistry.

Experience: Continous employment since 1920 as laboratory supervisor, dyer and mill chemist.

Age 49; married; references; position in southwest U. S. desired.

5-30, 6-13, 6-27, 7-11

49-13

Education: Lowell Textile Institute, B.T.C.

Experience: Laboratory and mill chemist, 1931 to date.

Age 41; married; references; position as plant chemist or executive, or in sales, desired.

5-30, 6-13, 6-27, 7-11

49-14

Education: B.S., Brooklyn College, now completing year in Bradford Durfee Technical Institute.

Experience: Instrument specialist, U. S. Army Air Corps.

Age 25; married; position as dyestuff or textile chemist near New York, or elsewhere on Atlantic Coast, desired.

5-30, 6-13, 6-27, 7-11

49-16

Education: Chemist.

Experience: Dyer, hosiery.

Age 54; married; references. Southern U. S. preferred.

6-27, 7-11, 7-25, 8-8

49-17

Education: New Bedford Textile Institute.

Experience: 16 years chemist, dyer and head dyer, cotton and rayon.

Age 40; married; references. Eastern U. S. preferred.

6-27, 7-11, 7-25, 8-8

49-18

Education: B.S., Mass. Inst. of Tech.; further courses elsewhere.

Experience: Textile chemical, laundry and garment analysis, including executive and sales service work.

Age 41; married; references; now located in middle west.

6-27, 7-11, 7-25, 8-8

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Report of Philadelphia Section

A MEETING of the Philadelphia Section was held on May 20th in the English Room of Kugler's Restaurant in Philadelphia.

Chairman James Dixon conducted the business part of the meeting which included reports from our various committees. Among these Edgar Beigbeder of the Membership Committee announced that the increase in our Senior Members will entitle us to our sixth councilor for the year beginning 1950. John W. Jordan gave the final plans for the outing to be held June 10th at the Whitemarsh Valley Country Club. These include a sport broadcast by Tom Moorehead, prominent local sports commentator, who will talk from the speaker's table at the outing over WFIL. A television broadcast of Golf and other events of the outing will be cast over WFIL-TV. Many sporting events, prizes, a fine dinner and a floor show will round out the day.

Chairman James Dixon appointed Arthur W. Etchells as Chairman of the Nominating Committee. Prof. P. Theel, Elmer C. Bertolet, William Ebersold, Curt Baeringer, L. O. Koons and E. C. Diehl, were also named to serve with this committee. A report of their selections for the year 1950 is to be made at our next section meeting to be held on September 16th.

W. O. Neeb, Chairman of the Program Committee, introduced the speaker of the evening as Charles W. Carvin, who presented an outstanding popular talk on "Rayon". The excellent humor of his talk was enjoyed by everyone.

George Altenbaumer of the Fred Whitaker Co. exhibited films of our outings of 15 years ago as well as one taken in color of our 1948 outing.

The dinner preceding the meeting was attended by 115 members and guests, while 145 attended the meeting.

Respectfully submitted

THOMAS H. HART,

Secretary.

Dr. William F. Luther

Intersectional Contest Committee, South Central Section

DR. WILLIAM F. LUTHER, Head of the Textile Division of the Industrial Research Institute, University of Chattanooga, and Director of Research, Dixie Mercerizing Company, is Chairman of the Intersectional Contest Committee of the South Central Section. Dr. Luther received his B.S. in industrial chemistry from the University of Kentucky in 1936, his M.S. from the University of Iowa in 1938 and his Ph.D. in 1940. His experience has been principally in organic and cellulose chemistry. He spent several years in viscose rayon with DuPont and American Enka and has held his present position since March, 1946. Besides his A.A.T.C.C. affiliation he is a member of A.C.S., A.S.T.M. (Committee D-13), American Society for Quality Control and Sigma Xi.

Other members of Dr. Luther's committee are:

O. T. Lankford
Dixie Mercerizing Company

Homer Whelchel
Central Franklin Process Company

H. H. Eagar, Jr.
Standard-Cossa-Thatcher Company

W. G. Agnew
Dixie Mercerizing Company

H. A. Webb
General Dyestuff Corp.

J. H. O'Neill, Riegel Textile Corp., will be the Judge representing the Section and the paper will be presented at the Atlantic City Convention in October by Dr. Luther. The title of the paper is "Factors Influencing Crockfastness of Naphthol Package Dyed Cotton Yarns."

Outing, New York Section

THE annual outing and golf tournament of the New York Section was held at the North Jersey Country Club on June 17th. Robert Brewer, Outing Chairman, tied H. E. Stevens for low gross. Both had 77s and will play off the tie at the 1950 outing. In the play-off of the triple tie of last year, Mr. Brewer won from M. Mulqueen and William P. Holt.

Both J. A. Kominos and E. C. Grilli had an 82 for second low gross with Mr. Kominos winning the draw. There were twelve who had below 69 for 1st low net and Herman Steen won the draw. There were four tied for second low net with 69 and the draw was won by L. Turits. The first kickers number drawn was 75 and E. Gsell, Jr., won first prize and Richard Illingworth, second prize. The second kickers number was 78 and A. F. Johann won first prize, W. S. Luqueer won second and B. Winkler, third.

In the driving contest Robert Brewer won the Class A Contest with a drive of 273 yards, H. M. Sawyer won the Class B Contest with 252 yards, and K. Wall the Class C Contest with 242 yards. The putting contest resulted in a triple tie at 33 among William Harris, M. Mulqueen and B. Basso. The draw was won by Mr. Harris.

In the horseshoe pitching contest, with Robert Holoch as chairman, prizes were won by Louis Dogin, Charles Pruiskma and Robert Hoffman.

About 150 persons took part in the golf tournament and there were 56 entries in the horseshoe pitching tournament. Charles W. Dorn, Section Chairman, presided at the dinner in the evening at which about 300 were present and Robert W. Brewer awarded the prizes.

Respectfully submitted,
NORMAN A. JOHNSON,
Secretary.

Report of New Bedford Student Chapter

AT recent meetings of the New Bedford Textile Institute Student Chapter, G. W. Searell of Jacques Wolf & Co. spoke on the preparation, refining and cost of various thickeners; the Calco Chemical Division of American Cyanamid Co. showed a motion picture entitled "Portrait of an Industry"; and Mr. Redmond and Mr. Quigley of the Textile Colors Division, Interchemical Corporation, showed a motion picture on pigment printing, illustrated with samples and actual preparation of printing paste.

Respectfully submitted,
RAYMOND K. SILVEIRA,
Secretary.

James D. Dean

International Contest Committee, Southeastern Section

JAMES D. DEAN, Head, Cotton Chemical Finishing Division, Southern Regional Research Laboratory, U. S. Department of Agriculture, is Chairman of the Intersectional Contest Committee for the Southeastern Section. Mr. Dean entered the cotton finishing business immediately after his graduation from Brown University, and has since then been connected in various capacities with several textile concerns, including the Pacific Mills and the United States Finishing Company. His experience has been chiefly with dyeing, printing and finishing cotton and rayon piece goods. In 1941 he served in the Office of the Quartermaster General at Washington, and in 1942 transferred to the Department of Agriculture, Bureau of Agricultural and Industrial Chemistry, and has since been located at that Bureau's Southern Regional Laboratory.

Other members of Mr. Dean's Committee are:

Charles F. Goldthwait
Southern Regional Research Laboratory

Herbert O. Smith
Southern Regional Research Laboratory

Robert O. Simmons
Pepperell Manufacturing Company

S. Jack Davis
Calloway Mills Company

Howard M. Waddle
West Point Manufacturing Company

Dr. James L. Taylor will be the Judge representing the Section and the paper will be presented at the Atlantic City Convention in October by Herbert O. Smith. The title of the paper is "The Application of a Differential Dyeing Test for Fiber Maturity to the Processing of Cotton."

Mid-West Section

SHRINKAGE CONTROL OF WOOL—CHLORINATION PROCESSES*

JACK EPELBERG

Cluett, Peabody & Co.

As all of you know, one of the reasons for the early acceptance of wool as a clothing material has been its ability to "full" or "felt". Though this tendency to felt is desirable and essential in the production of some kinds of woolen material, it also creates the hazard of shortening the useful life of items made from them by possible further felting if the garment is subjected to washing.

The inability of wool to retain its original size after repeated launderings has been recognized for years as its principal limitation, and a considerable amount of work has been done, aimed at eliminating this undesirable feature. By the end of the war, the Army was treating some 8,000,000 pairs of socks per month, and as a result of such treatment, the average wear life of the socks was more than doubled.

I am going to attempt to review briefly some of the methods used for achieving this shrinkage control.

The causes of mechanism of felting, in general, have been ably explained by Milton Harris on many occasions. He has also shown that any treatment which reduces the differential friction effects of the scale surfaces, or which modifies the elasticity or elastic recovery of the fibers is more or less effective in overcoming felting.

Reduction of the diffefential friction effect has been accomplished by one of the following three methods:

(1) Modifying the surface layers of the scales by chemical alteration in the molecules.
(2) Removal of scales or of surface layers of scales by chemical action or mechanical abrasion.
(3) Masking the surface of the scales with resins or with insoluble compounds.

Most of the existing shrinkage control processes, that are used commercially to produce unshrinkable wool, fall into four main classes:

(1) Enzyme processes
(2) Solvent processes
(3) Resin processes
(4) Chlorination processes

The basis of the enzyme process stems from the discovery that the enzyme papain in the presence of a dilute solution of sodium bisulfite has an intense action on wool. The investigations of the enzyme process have not yet shown particularly desirable characteristics. So far the tests have shown that for the amount of shrink resistance accomplished, the modification of the wool fiber has been considered excessive. Much is to be learned about this process before it can be considered commercially practicable.

The alcoholic alkali process was developed from the researches of Freney and Lipson in Australia and involves the treatment of wool with alkalies, such as sodium or potassium hydroxide or organic bases, under such conditions that only the surface structure of the wool fibers is attacked and altered, thereby eliminating felting. The wool is treated with potassium hydroxide in organic solvents such as methanol, ethanol or aromatic alcohols which prevent the penetration of the alkali to the core of the fiber. Our experience with processes of this type has been that, unless the process is very carefully controllel, they tend to damage the wool and impart a harsh handle. The solvent presents a fire hazard and, unless an expensive solvent recovery system is installed, the cost of treatment is much too great for practical commercial use.

The statements made about the Freney-Lipson process would also apply to the Drisol process which employs sulfuryl chloride in the presence of an organic solvent such as white spirits.

Some more recent processes developed in the United States for controlling shrinkage of woolens are based on the impregnation of the wool fabric with resins.

One type involves the use of a thermoplastic rubber-like compound which requires no cure. Representatives of this class of treatment are Durlana and Koloc. These products are generally applied as aqueous dispersions. The fabric is padded with these solutions, dried and finished conventionally.

The other types of resin treatment are based on the us eof thermosetting alkylated methylol melamine resins. The application of this type of resin consists in passing the fabric through an aqueous bath of the resin plus catalyst after which the fabric is run through a pad mangle, dried and cured for five to six minutes at 300°F., after which the material receives ordinary finishing.

The two most commcn melamine resins used are Monsanto Chemical Company's Resloom and American Cyanamid Company's Lanaset.

There has been some controversy between the resin manufacturers as to whether the resin is deposited within the fiber and reacts with the wool protein or is deposited on the surface. A recent study by American Cyanamid employing a dye staining technique and the electron microscope seems to indicate that the resin is merely deposited on the surface.

Some of the mill men have objected to the high temperature required for curing the melamine resins. A new technique developed by American Cyanamid Company and announced last month is specifically aimed at overcoming this objection. The new technique calls for pretreating wool in a 2 to 3 volume peroxide bleach bath and then padding on the acid colloid resin solution which is prepared by ageing the melamine resin with acetic acid. The fabric so treated need only be dried to effect the cure.

The resins do, however, have somewhat of a tendency to impart a stiff handle to the treated fabrics, also the degree of shrinkage control obtained with resins is somewhat dependent on the temperature and severity of wash. High temperature causes the resins to hydrolyze and the fabrics will then show progressive shrinkage.

On the other side of the ledger the resins do add weight and tend to cut down

* Presetned at Mid-West Section Meeting, May 7, 1949.

relaxation shrinkage.

Possibly the earliest attempt at chlorination of wool dates back to 1839 when John Mercer reported an increase in affinity of chlorinated wool for dyestuffs. This phenomenon, if it can be called that, is used to advantage in printing on wool.

Since then, the patent literature has been filled with innumerable patents aimed at eliminating the felting properties of wool and possibly just as many to increase the felting). I won't attempt to read any of these to you—but I have here 18 typewritten pages with references regarding shrinkproof wool, and this list is by no means complete.

I don't intend to go into the chemistry of the chlorination reaction, mainly because some doubt still exists concerning the course of reaction, but one theory which sounds good to me is that the chlorine oxidizes the disulfide linkages of the wool molecule and this is accompanied by a disarrangement of the surface layers of the cuticle and a reduction in the differential friction effect, rendering the fiber resistant to felting. The problem to be faced in the chlorination of wool is how to alter the surface frictional properties of the fiber without, at the same time, impairing the other desirable properties of the fiber such as strength, elasticity, hand, etc.

The essential weakness of the wet acid chlorination processes, arising from the rapidity with which wet wool and chlorine interact is, therefore, recognized to be that chlorine tends to be unevenly distributed over the sliver, yarn or fabric—the more exposed fibers absorbing a higher proportion of the chlorine.

Most of the commercial processes are, therefore, aimed at a more stringent control of the process by controlling the factors influencing the uniformity of treatment. It is in this respect, i.e., the method in which they achieve control, that most of the processes differ.

Some of the techniques used in achieving this control are as follows:

1. The gradual addition of the hypochlorite to the acid bath.
2. The use of retardants such as sulfonamides to withhold the chlorine from the wool.
3. Entering the wool dry and in oil.
4. The adjustment and control of pH values of the chlorinating liquors.
5. Pre-treatment or simultaneous treatment of wool with $KMnO_4$ on the alkaline side.

Some of you have undoubtedly recognized some of the existing processes by the above-mentioned methods of control.

I would like to devote the rest of my time in elaborating somewhat on the existing chlorination processes. Incidentally there is one great advantage for most of the wet chlorinating processes and that is, they require no special equipment, treatment being carried out in the currently available types of dyeing machinery.

Controlled Chlorination Method

The first method of shrinkage control which I would like to discuss is the controlled chlorination method, as specified by the Quartermaster Corps. for treatment of their socks and which is the subject matter of Patent No. 2,457,033 issued to Harry F. Clapham and Milton Harris.

In this patent, the authors claim the major object of the patent to be an adaptation of the hypochlorite treatment of wool for the purpose of making the same substantially shrink resistant, without the disadvantages inherent in the prior art, namely the disadvantages of wool fiber destruction and the disadvantages of streakiness of the treated goods.

Another object is a process which is not in need of careful control and meticulous supervision but which can be carried out safely and efficiently, even by relatively inexperienced operators.

The basis of the patent is the discovery that shrink resistance imparting treatment applied to woolen goods by means of hypochlorite can be carried out with best results and a maximum degree of safety if the hydrogen ion concentration of the solution is so adjusted that its pH is between 7.5 and 9.0 (optimum around 8.5).

The preferred buffer is borax and the addition of sodium bicarbonate has been found necessary to bring the pH of the solution below 9.

The authors go on to point out that the treatment of the wool, in accordance with their process, results in a slight yellowish discoloration which must be compensated for in the dyeing.

A typical example of the treatment consists in wetting out 100 pounds of woolen goods in a solution of 3 pounds sodium bicarbonate and 3 pounds of sodium tetraborate in 360 gallons of water. This provided a solution buffered at pH 8.5. Seven pounds of calcium hypochlorite containing 70% available chlorine dissolved in 21 gallons of water were added over a period of 20 minutes, whereupon the batch was allowed to soak an additional 30 minutes until the chlorine had been substantially completely reacted. Then one pound of sodium bisulfite was added and an additional soaking time of 10 minutes allowed. The woolen goods were then finished conventionally.

Harriset Process

Patent No. 2,466,695 is the basis of the Harriset Process, the significant difference of this process is that Harris has made his process continuous, rather than batch. Being continuous, the chlorination takes place in a matter of 10-15 seconds. The wool is scoured and brought to a uniform pH and passed through a special range equipped with automatic pH control, temperature controls and flow meters, to feed the hypochlorite and other chemicals necessary to maintain a controlled pH. The equipment used is specialized and rather expensive.

The process is best suited to treatment at the top stage. In a recent article, it was pointed out that the natural properties of the wool fibers are said not to be measurably impaired by the process. The treated top may feel slightly harsher than the untreated fibers. This harshness is generally compensated for by the addition of softeners so that when the top is spun into yarn and made into fabrics, the difference between the treated and untreated garment is practically unnoticeable.

In most instances manufacturers have reported that the spinning quality of treated top is measurably better than that which is untreated. This is said to be due to the increased coefficient of friction in "Harriset" treated wool which, for the same reason, also gives a higher yarn strength than comparable untreated yarns.

Dyeing may be carried out subsequent to the Harriset treatment either in top, yarn or garment stage and fastness and levelness will not be impaired. The process does increase the rate of dye take up, but in some instances, only minor adjustments of the dye formula will be required to match a given shade.

Protonized Process

I should next like to discuss the Protonized Process of Alrose Chemical Co., which is the subject of Patent No. 2,247,-097.

This process is based on the use of a novel chlorinating agent Alrochlor-sodium sulfamate and can be carried out on wool at any stage of processing previous to dyeing.

The sodium sulfamate converts the hypochlorite to sodium chlorosulfamate—this results in a much slower exhaustion of chlorine. A small amount of formaldehyde is generally added to the batch to protect the wool from degradation. Too much formaldehyde, however, effects the dyeing properties and hand of the wool and reacts with the chlorine.

The sequence of operations is as follows:

1. Scour wool and remove material from machine.
2. Charge machine with water at 100-115°F.
3. Add non-ionic wetting agent.
4. Add formaldehyde.
5. Add sulfuric acid.

6. Run machine for one or two minutes.
7. Add sodium sulfamate—sodium hypochlorite mixture.
8. Mix one or two minutes.
9. Add wool material as rapidly as possible.
10. Run until available chlorine is exhausted (30 minutes).
11. Rinse followed by a sodium bisulfite antichlor and final neutralization with sodium bicarbonate.

According to the authors wool so treated possesses the following advantages:

1. Retains the original soft and resilient hand of the wool.
2. Improves abrasion resistance.
3. Whitens wool.
4. Little or no tensile damage.

The authors have also recently announced an alkaline process in which the wool is first pretreated and then chlorinated with about 3-8% chlorine—exact details are not available at present.

Schollerized Process

The Schollerized Process is promoted by Scholler Brothers, Inc. It is a two step process involving pretreatment with Trisconize A. After pretreatment with Chemical A, the bath is dropped and a new bath prepared in which Trisconize B, previously dissolved in water, is added. The fabric is run in this solution for 30 minutes.

Additional Chemical B and hypochlorite are next added, and the fabric run in this solution for exactly five minutes after which the solution is dechlorinated with sodium bisulfite and subsequently rinsed.

Trisconize A and B act as buffering agents to prevent overtreating and are in this respect quite similar to the chemicals used in the Clapham Process (borax and sodium bicarbonate).

The claims made for this process are:

That it protects against shrinkage, matting and felting.

That it prohibits the slightest change in texture, resiliency, elasticity or hand of the original wool regardless of how many times it is washed or rubbed or tubbed.

S. W. Process

The next process to be discussed is the S. W. Process which forms the basis of U. S. Patent No. 2,429,082 and is being currently promoted by Cluett, Peabody & Co., Inc. in connection with its promotion of the trade mark "Sanforlan" on shrink-resistant woolens that meet Cluett's requirements and specifications.

The S. W. Process is interesting from the technical viewpoint since it makes use of a principle which has lately received only faint recognition. It is, that a modification of wool can often be better achieved in two simultaneous treatments rather than in one, so that the ultimate result desired can be obtained more smoothly and under less drastic conditions than is possible without such activation.

This process takes advantage of the discovery that the anti-shrinking effect on the animal fiber is greatly enhanced by combining the oxidizing action of permanganate compounds with the halogen, either in one bath or in separate baths, under suitable conditions as to pH of the solutions.

This effect is achieved while still retaining all the attractive properties of woolen fabric or yarns, giving the wool an improved appearance, handle and loftiness. It is advantageous to employ the permanganate hypochlorite method with the two reagents combined in one bath since the mixture gives a stable solution which will react in alkaline solution very slowly with wool to give uniform resistance to shrinkage.

According to the authors the advantages of the present invention in comparison with the usual acid hypochlorite chlorinating processes are:

1. The animal fibers are subjected to an even anti-shrink treatment which is readily controlled and shows low loss of protein matter.

2. The treated wool develops an improved soft handle and luster and retains its loftiness and resiliency even on repeated washing.

3. The process has less effect on the colors of dyed wool.

4. The treated wool is more uniform and subsequent dyeing processes are facilitated.

5. The process can be carried out in almost any type of machine—wood, stainless steel, etc.

Negafel Process

British Patent No. 537,671 serves as the basis of the Negafel Process. This invention provides a process of treating wool wherein the wool is entered in the chlorinating bath in an unswollen state with a small proportion of oily substance present. In addition to the halogen compound, there is also present an acid, possessing reducing properties such as formic acid, plus an additional buffering agent such as sodium formate. By this means it was found that the initial strong action of the halogenating and oxidizing agent is limited to the surfaces of wool fibers and excessive oxidation is prevented. In an improved modification described in British Patent No. 557,600 carbon dioxide is used to replace the greater proportion of formic acid. The pH during treatment is around 5.

Other Processes

Other wet chlorination processes in present use which employ similar principles to those already mentioned are:

Hypol Process—Aktivin Corporation—uses P-toluene sulfonamide as the retarding agent.

Kroy, Kelpie } Wet contact process about which not much is known.

Before leaving chlorination processes, it might be well to mention briefly the dry chlorination treatment which was developed by the Wool Industries Research Association in England. The process is described in British Patent No. 417,719. The process consists of pre-drying the wool to a definite moisture regain (usually about 7%) then introducing chlorine gas into an evacuated chamber containing the wool until a fixed ratio exists between wool and chlorine. After the wool has been in contact with the chlorine for a fixed time interval, the chamber is again evacuated and the wool neutralized and dried. The apparatus required for such a treatment is highly specialized in nature and not too much of this equipment is available in this country. In this process, the condition of the wool prior to treatment is very important as well as the length of time during which the wool is treated with the chlorine.

The advantages claimed for this process are more thorough and consistent treatment which leads to uniform dyeing, less loss of weight and less batch to batch variation than wet chlorination method.

The biggest disadvantage of the dry chlorination method is the harsh hand that is imparted to the wool.

Merits of a Process

Having discussed the available processes, I should like to list five questions which Dr. Phillips of the Wool Industries Research Association thinks should be clearly borne in mind when deciding the merits of any proposed process.

1. Can the process be controlled so that there is no batch to batch variation, or variation with time, if the process is continuous?

2. Are all the fibers treated and is it possible, when thought desirable, to give all the fibers a partial treatment? Can the process be applied with equal success to tops as well as fabrics?

3. Can the treated wool be dyed level or is it necessary to overtreat to insure that all the fibers have been treated and hence will all dye to the same shade? If the treatment is carried out on dyed top, yarn or fabrics, will the color be affected and to what extent?

(Continued on Page P533)

Pacific Coast Section—

THE "NEW LOOK" IN TEXTILES*

RAYMOND W. JACOBY
Ciba Company, Inc.

IT certainly gives me a great deal of pleasure to come out here and greet this Pacific Coast section. We in the East are very proud to know that we have a Pacific Coast Section, for now at last the A.A.T.C.C. actually spans the continent.

Two weeks ago today in New York at the Council meeting the officers and councilors knew I was coming out, and they asked me to extend to you personally the greetings of the whole central organization. They told me that while you are a long way off, they hoped that our contacts will be as close as possible. An Easterner comes out here to the West with great fear and trepidation. We get a long, hard briefing on what we should say and do, and what we should not do and not say. It is understood to be a criminal offense to speak about rain out here, so all day I have been slopping around in heavy dew. Mention of snow, I understand, calls for capital punishment. Upon arrival here day before yesterday, I found that the seven inches of heavy frost you had were stupendous and colossal. The little flakes of frost were whiter, colder and larger than any that had fallen hitherto.

For ten years the textile industry has been living in a fool's paradise. We have had a seller's market the like of which we have probably never seen before. It was a condition where anything went, of "Here it is; take it or leave it." That picnic is over. You men are realizing it every day as materials begin to come back. We are getting, once again, into a competitive market. When you think over the textile industry you will realize that it is doubtful that there is any industry in the United States which has had the mortality rate which has existed in the textile industry. One does not have to be very old to think of names which were once great and which have passed into oblivion—Garner, Hamilton, American, Rockland, and many others. They were great in their day, but their day waned and died. On the other hand, there are organizations which were great and have been great through the years. Sayles and Bancroft have been great names for over 100 years, Glenlyon for almost fifty years, and many others. They have an unbroken record of success, though they faced the same adversities as those who failed. For those companies which failed, one can sum up their failure in two words, "They compromised." They compromised with quality, and they compromised with price. You men are going to be confronted with a situation where it may be enticing to compromise, to cut off a quarter of a cent a yard or more and hope that somehow you will make it up. It is easy enough to go down-hill, but it takes effort to climb, and the laws of gravity show that when you start downward you go downward at an accelerated pace, and the first thing you know you are at the bottom of the hill in the mud puddle, wallowing around with lots of other people who compromised and hoped to get by.

As I see the future of the textile industry, there are two bases upon which we can proceed safely. Naturally we have to cut costs. We have to cut costs in every way we can, but in doing so we must be careful not to jeopardize quality We have selective customers today, and they are going to be more selective. Do not forget we now have with us eleven million ex-service people who for several years had fabrics which were put to uses more severe than they will ever meet in civilian life. These materials stood up, and those people know they stood up. You cannot give these same people bunk and say, "We can't give you anything better." They know they can get quality, so they will demand and will get it.

The other alternative is to do something different, and that is my theme tonight, "the 'New Look' in Textiles." These companies that today are adopting the "New Look" are doing something different; and these same companies are the ones whom, I think, are going to survive. We have in our vocabulary today many new words: thermosetting resin, polymerization, pad steam, Williams unit, stainless steel, long chain polymers, emulsion phases, hydroscopic agents, reduction potential, cationic and anionic materials, cellulose esters, stabilized, preshrunk and countless other names. These are part of our everyday conversation, and that is what is contributing to the "New Look" in textiles.

Taking some of these names—the pad steam as you know is comparatively new, and for those of you who are not familiar with it, consists of applying the vat colors in pigment form, running the goods through sodium hydrosulfite and alkali, and then through a steam box where reduction takes place. I have pictures here of pad steam units. When this process was started, there was talk about reduction in ten seconds. A technical organization I know made a report on the pad-steam process, and they issued the very learned conclusion that it is impossible to reduce a vat color in ten seconds. Today the industry is figuring three seconds, so although it just cannot be done, they are doing it.

To give you an idea of some of the shades which are produced by the pad steam process, these are actual cuttings from plant runs, showing we can get really heavy shades. That ten second or three second reduction opens up new fields of venture in vat color application. In conventional vat color printing various chemicals are necessary in the print paste as well as an ageing process running into several minutes, but today the Cellapret process is coming into extensive use with its tremendous possibilities. The vat color is printed in pigment form in just a thickener and can lie around indefinitely. As you know, when vat colors are printed in the conventional way they have to be aged very shortly thereafter or you will get decomposition. Goods are padded through caustic and hydro, aged, and you get heavy patterns like these in from twelve to fifteen seconds ageing, These are actual prints which have been run by the pad-steam method, and I picked this one particularly because of the fineness of detail which was carried out very splendidly. Here is one to show the areas of blotches and depth of shade which are produced. Here is another which is a rayon fabric fifty-four inches wide with

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bright clear colors. All of you will agree the outlines are sharp and the coloring very beautiful.

That time factor is something that we must bear in mind as having a very important influence. Here I have a group of prints which were developed by Ameritex and done by Cranston Print Works. They are all duplex registered prints 100 per cent vat colors, vat printed and vat dyed.

I purposely selected colors in these samples which would be antagonistic to each other ordinarily, but with this reduced time of dyeing it is possible to get the effect without one "killing" the other. Any of you dyers or printers know what would happen if the two colors got together. Yet, here is grey and orange, and the orange is not dull. Here is a pink and a green which has not been dulled. These patterns were purposely selected because of the contrasting colors, and they are run this way with very beautiful results. The duplex effect gives uniformity so that it looks like a jacquard pattern. Here is a little pattern I selected just because it is a three-color job, but with fine stipple printed on it. I do not know how many shades are there, but they are numerous and give a very beautiful effect. By the same method, we are able to get resist effects of dark prints and whites on dyed ground. These are all 100 per cent vat color jobs. Here is another very interesting sample which was all vat color ground, vat color print.

You men who are job dyers probably know that most of your customers feel prices are too high. That is the general story. When they ask, "How much?" and you tell them, they say, "Too much." That seems to be all they are able to say. So a number of years ago one customer in the East obtained a price from a finisher on dyeing, and he immediately complained that the price was too high. Finally he had a bright idea, so he said to the dyer, "People only see the face of a piece of goods. Why not dye it on just one side, and it will only cost half as much?" Well, I do not know why you are laughing. That is a pretty good dye job. It is dyed only on one side. It is a piece of U. S. Army fatigue uniform, which we can really say was dyed on one side.

Here is a very beautiful job. This is all vat color, vat dyed and vat printed. I think any of you, if you would look at this pattern held this way, would say it was vat dyed and vat printed, but if the other side is turned you would admit that it is just dyed on one side. This is a very beautiful job of stipple ground and an engraved line all done on the same roller.

Other words we use are thermosetting resins and polymerization. As you know, the peculiar characteristic of resin is to keep the form under which it has been polymerized. There are a number of patents, the basic Swiss patent of Raduner, others by T.B.L., C.P.A. and the more recent patents by Bancroft and Cranston Print Works, whereby this feature of thermosetting resin is put to a wide variety of uses.

You are familiar with glazed chintz. Here is a sample of a thermosetting resin processed which was glazed and cured, and the glaze becomes permanent. The standard requirement for this is that it must stand five American Institute of Laundering washing tests. In use they have stood up under twenty commercial launderings and still retain this appearance.

I have here two samples of glazed finish. One is a soft finish, and one a firm finish. You can get them in various degrees between.

Then we come to another development of the glaze finish idea. You remember when the ladies had silk petticoats. It may be history to some of you people. They were all proud of the "scroop" of a silk petticoat. This material has a lot of "scroop", a piece of eighty square sheeting with as nice a "scroop" as a piece of silk. It is called "Everglaze Fabric." These first two glazed samples are the "Everglaze Finish." All of those were made by Joseph Bancroft and Sons. That is practically a real taffeta made out of a piece of eighty square sheeting.

Another finish along the same idea uses a different type of calendering to give a particular hand. You would have to handle this piece to appreciate it. It does not have quite the "scroop" the other one has, but again there is a permanent hand which is unique on an eighty square sheeting. This also is "Everglaze Fabric." These were done with plain calendar rollers. Here are other samples done with engraved rollers. All of these samples are labeled. You can look at them afterwards. This was an ordinary piece of chambray. It was treated with a resin and then run with an engraved roller to give the moire effect. This was yarn dyed red and blue, bringing the various shades to the top, giving not only a moire effect but a colored moire. This was made with another type of engraved roller. This again is an eighty square sheeting.

Do not forget in looking at all these that they are just ordinary cotton percales. Here is a moire effect on a solid dyed piece of goods. Repeating, these are permanent finishes.

Another development of Bancroft is what is called the "Stazenu" finish. You are all familiar with seersucker. One characteristic is that seersucker fabrics look as if they were slept in. If they were slept in a week they wouldn't look any worse, but they still do not look quite as nice as they might. This is a piece of seersucker given this "Stazenu" finish, which is stabilized at two per cent. That is less than two per cent shrinkage. It has resiliency of three or better on the crush-proof standard. There is a piece of seersucker which is a lot better than it ever started out to be, again with a permanent finish.

Another phase is a chemical treatment of cotton called "Stazenu B". This is a piece of cotton the feel of which is the closest to a piece of wool any of us ever has seen come out of a cotton field. This again is stabilized to two per cent shrinkage and has a resiliency of three or better. In this treatment there is no loss in tensile strength of the goods.

Another development is the Banflame or fireproofing process which is a patented process of Joseph Bancroft and Sons. Here is a piece of Banflame treated rayon. It has not affected the hand. Here is a piece of cotton drapery. You people in California, particularly with your laws are very conscious of the inflammability of textiles. I will cut off pieces of these and light them to show you. Here is the rayon piece which is fire-proof. It will gradually char, but it will not support combustion. Here is the piece of cotton. It really does meet the California law.

Here is another phase in these finishes which is the development of the Apponaug Company. They have what they call a "Plisselle" finish. I have a whole group of samples here. You all know what an 80 x 92 sheeting looks like. Here it is, just an ordinary piece of sheeting. All this group of finishes were the same fabric originally. These are again following out this resin process. They are impregnated with resin. They are embossed and cured, and we get the chevron effect. Here is an all-over diamond effect. This is the so-called Birdseye. There are various other effects all of which will stand the American Institute of Laundering test; they have had twenty commercial launderings and have retained their appearance.

This looks like a beautiful piece of basket-weave cloth. That is what you might think, but it actually was a piece of plain sheeting. The same idea is carried out on this piece with an engraved roller, giving this swirl effect. This again is an ordinary piece of cotton sheeting made to look like what it "ain't." They have carried this method farther and produced a taffetized finish. This is "Apponized Z" which gives a piece of cotton "scroop."

The same idea can be applied locally. If the resin is printed in spots and the goods then subjected to any of these

processes, it assumes whatever impression it is receiving where the resin is, and is cured, then washing eliminates that appearance in the places where the resin does not exist. It is possible to get the biddseye and waffle-cloth effects in limited areas and have the rest of it plain.

I am sure all you ladies would say that this is a beautiful piece of piqué. Actually, it was just a plain piece of sheeting which has acquired the hand, the appearance and the feel of a piqué. Again, these will stand up in actual use.

Another group of words that we use is long chain polymers, the most common of which is nylon. Here is a piece of cloth woven solid with alternate ends of nylon and rayon, and the rayon dissolved out leaving this effect. That same idea is carried out on this piece of goods, a mixture of acetate and rayon with the acetate dissolved out to fit the floral pattern. That is a simple process. Alternate ends of the warp and filling are of different fibers. In other words, we have these ends of acetate and these ends of rayon. We weave them together and they make a solid piece of cloth. We have chemicals which destroy one and not the other. In destroying one, they leave the open effect. I learned very early in this game that one should be very careful how he uses the word "No." You can understand how we get these cut-out effects with different fibers. Suppose somebody said to you, "Can you make a cut-out job of an all cotton fabric?" The logical answer is "No." If this is cotton and this is cotton, and you cut out this one, then this one goes and you have nothing left, so you would be inclined to say "No." But please do not, because here is a 100 per cent cotton fabric with part of it cut out. That originally was a solid piece of cloth.

The Williams Unit is a form of a dyeing unit that is being used extensively on all types of fabrics. I was talking to a man the other day, an experienced dyer, and he said, "When you have a fabric consisting of a mixture of spun rayon and acetate, you cannot do a good vat dyeing job without saponifying the acetate." That seemed more or less natural, except that I brought him these three samples here, and I purposely picked the shades as being difficult ones. These fabrics are of 70 per cent rayon and 30 per cent acetate, and they are dyed very evenly and beautifully on the Williams Unit. The fellow who said that it couldn't be done looked at them a few minutes and turned and walked away. He said, "I still don't believe it." This is given the Sanforset finish, which is a shrink-proof finish, stabilized to two per cent. These were finished by the U. S. Finishing Company, Sterling Branch. Here you have a fabric of acetate and rayon which would be ideal for sportswear. It is fast to perspiration, washing, and sunlight, and stabilized as to shrinkage. It is a fabric which should stand up to every use to which it would be put.

Here is another piece of goods, and I do not know whether you folks think you can see anything on it or not. Does anybody think he sees anything on there? There is absolutely nothing on that cloth. As you know, an ordinary piece of cotton cloth is white like this, but upon being printed with a gum to protect it in given areas, and then treated with sulfuric acid, the rest of it becomes transparent. Where the cloth is protected, it is not affected, so you simply have the untreated, unaffected cloth versus the transparent cloth, giving the appearance of a pattern. This was a plain organdy. The processing is carried along further, and it is given a plissé finish. This is Glenlyon Print Works "Shadow Ripple." There you have this shadow effect, plus the plissé. We can go one step further and print color in with the protective material, then we get a combination of color and plissé.

Here is another piece which is perhaps more striking. It is a multi-color print which has the color effect, the shadow effect, and plissé. Here is a stabilized or a permanent viscose finish to distinguish it from the permanent resin finishes. This has all the durability of the resin finish, and is known as the "Saylorized" finish of the Sayles Finishing Plants.

As you know, since rayon has been supplanting silk, we have tried to make the rayons feel like silk, and have done a pretty good job. Now we are trying to make the rayons look like silk. I think you will agree with me that is a pretty good silk coloring combination, and this also. Both pieces are rayon, printed with acid and direct colors, and we now can do on rayon the same vivid bright and attractive coloring which made silks so popular.

The Sayles Finishing Plants have other guaranteed finishes, of which these are two samples. This one is a spun rayon gabardine that is all that it is guaranteed to be. It is guaranteed less than one per cent residual shrinkage, guaranteed fast to laundering at 160 degrees Fahrenheit, fast to perspiration, fast to crocking, fast to hot pressing, fast to forty Fade-Ometer hours, and fast to atmospheric fading. It is all viscose.

This fabric is a spun rayon and spun acetate mixture, and again this is a permanent finish guaranteed less than one per cent shrinkage, fast to laundering at 160 degrees Fahrenheit, fast to perspiration, fast to crocking, fast to hot pressing, forty Fade-Ometer hours, resistant to atmospheric fading, and non-chlorine retentive. That is quite a long story to tell about a piece of cloth. There it is with the guarantee of a real worth-while organization to back it up.

The fast to light direct colors are being extensively used in printing draperies. Here is a very colorful example. I know you folks out here do a beautiful job, but we still think this is a pretty good job. These have the extreme light fastness characteristics of the fast to light direct colors, particularly in the light shades, which are difficult to obtain with some other types of colors.

Here is another type of work of which quite a good deal is being done. It is knit material for slip-covers. This was done by Queen Dyeing Company for Comfy Manufacturing Company. It is more or less elastic and it will fit and hug the piece of furniture for which it is made as a covering. This is double printed as it is woven tubular. That means two runs through the print machine. I think you will agree with me it is a very excellent job. Knit goods are also printed in the split form of which this is a sample. That is, they are cut before printing, and that, as you can see, very well presents quite a few problems to the printer as it is done in the open form. Here is a piece of rayon underwear printed in the tubular form, which of course means two runs through the print machine.

In addition to the chemical and physical processing of fabrics, there are a number of other developments. The predictions are that next summer tropical worsteds are going to be in rather short supply. As you know, there has been a drop in the supply of wool in this country. They say the Russians are buying large amounts of the Australian wool crop, and the snow storms have wreaked havoc on our sheep herds, so the feeling in the trade is that next summer tropical worsteds are going to be rather scarce. You have probably all seen in the ads of the Saturday Evening Post the men's wear fabrics which Burlington Mills have developed. These are all synthetic and the descriptions are here. These three fabrics are all intended for men's wear to use where tropical worsteds have been used. These are proving very successful. They are beautifully styled, beautifully manufactured, and the description of them is on the various pieces. This one is cellulose acetate and spun rayon suiting. They are all synthetic and the damage done to our wool crop is not going to be too serious if we can have fabrics like these which will be durable.

Dan River has developed a fabric which they call a cotton tweed. That is rather a unique fabric, both warp and filling, with slub effects to make it look like a real woolen tweed, and this is stabilized

and wrinkle resistant so that it should be very serviceable.

When it comes to the question of shrinkage in wool, it is of particular importance in garments such as sports shirts, etc. which would be washed. There are several processes in commercial use today. One is the Harriset process or the chlorination process. These are some goods from the Barre Wool Combing Company in South Barre, Massachusetts. This piece of goods is woven of yarn in which the stock used in the manufacturing of the yarn was treated by the Harriset process. This has had five nineteen-minute launderings. Here is a piece of a similar cloth woven of yarn which had not been given the Harriset treatment, given the same washing. You see what happens to it. The Harriset treated piece shrunk two per cent in total area while the untreated piece shrunk thirty-six per cent in total area.

Here is a piece of knit goods, produced by Princeton Knitting Mills, of all wool knit goods, tubular knit wool jersey, which has had the "Lanaset" finish. This is guaranteed after five A.A.T.C.C. washings to have less than five per cent shrinkage in either direction. That is a real accomplishment in wool jersey.

These stabilized fabrics and fast dyed fabrics have been put to a number of uses, and they have been and are being developed very extensively by many finishers. Bradford Dyeing Association has a group of trade-marks of various finishes. Bradfaset is shrunk and stabilized, guaranteed less than one per cent residual shrinkage, and non-chlorine retentive. This Bradura is guaranteed fast to light, fast to washing, crease-resistant, stabilized, and shrunk. It has a very beautiful feel, so that in giving it all those qualities the other properties have not been impaired. The Bradye is an acetate fabric guaranteed fast to light, and gas fading. The Bradperma is a crease-resistant finish. All these trade-marks and several others are being well-established and well known in the trade, and these products do live up to the statements made for them.

Recently there was a little outburst of photographic printing which got off to a flying start, then died down, but here are samples of that work done in two different ways. One was with an Indigosol type color, developed by light. The other was a naphthol and salt process in which the naphthol was destroyed by light. In one case they use the positive and in one case they use the negative.

You may have had contact with glass cloth in its early days. If you did, you know how it was liable to cause an itching sensation. It was pretty miserable stuff to handle as little fine particles would come off. I used to have a couple of pieces that I showed by holding them like this, and then I would put them down as quickly as I could. Here are samples from the Owens-Corning Fiberglas Company. They were produced by a new process consisting of annealing and treating the goods with silcone. This is a piece of Fiberglas cloth which is just as soft as a kitten's ear, and I wouldn't mind handling this all evening and would have no feeling that I would be uncomfortable tomorrow. It is a casement cloth. Here is a marquisette. As far as your California flammability laws are concerned, they certainly conform, since they are all glass and will not burn.

It would not be right to be discussing the latest things and not mention silk. Silk is always popular, it is coming back in good supply, and again we are going to see fabrics on the market which have their particular appeal to the ladies. You are going to see more and more silk. The week before last I was in the Rock Falls Printing Company where they were printing nothing but silk. On the table they had this scarf which they gave to me. It is very appropriate because it is made for the California Centennial, 1949.

There is one thing which may confront some dyers, and that is the matter of wool socks. When one per cent nylon is added to wool, it increases the strength of the wool four per cent. That is cumulative. In other words, if you add twenty-five per cent nylon to woolen yarn, you increase the strength 100 per cent, so that a large number of former all-wool socks are going to have nylon incorporated in them. It is going to present some problems to dyers. Here are some I brought out just to show you it does not present too difficult a job, and with that tremendous increase in the strength of yarns, I think that the folks who have been dyeing wool hosiery are going to have more and more of this sort of dyeing to contend with.

There is another branch of the industry which is coming to the fore very rapidly, and that is the nonwoven fabric branch. You probably have seen some nonwoven napkins and towels, but last week I saw a development which is not going to be released until April 1; so they would not let me have a sample of it. It is a nonwoven drapery, duplex printed and absolutely fire-proof, coming on the market soon; and it certainly is going to make some people sit up and take notice. You have seen the paper draperies, but this nonwoven fabric as a drapery has the feel, the looks, the hand of a fabric, and it is an inexpensive proposition. I cannot give you details beyond saying that I have actually seen the finished goods. I have cut off pieces and tried to burn them. It is printed by duplex registered printing so you could hang it in the window and it would look as good from the street as it does from the inside. I think it is going to be a tremendous development.

Another item which is becoming very popular is this iridescent effect. This is a chambray. The iridescent effect, as you dyers know, is simply a question of the selection of dyestuff and is not produced artificially.

I have shown you quite a variety of samples and have done it for two reasons. In the first place, to try to arouse your pride in this industry in which we work. I would like you to feel, as I do, proud to be a part of an industry which has and is accomplishing such things. The second point is to give you an inspiration to participate in this development. In the East, the tradition of the West has come down from generation to generation. We have considered it the land of unfettered opportunity. Years ago Horace Greeley said, "Go West, young man, go West," and a hundred years ago the migration started with the cries of, "There is gold in them thar hills." Now you people are here. You are in this country which is free of the inhibitions and preconceived ideas which are so prevalent in the East. We feel that you are in that land of unfettered opportunity. The industry is comparatively new here as compared to the older established companies in the East. That newness is an advantage, and the possibilities are unlimited as far as opportunity is concerned. I wish tonight that you would take up that same old cry, "There is gold in them thar hills" and apply it in the industry in which you work. You can obtain it if you overcome the obstacles, and you will also make valuable contributions to the "New Look" in textiles. Thank you.

Discussion

George Cunningham: Are any of those coatings polyvinyl acetate coating, and if so, are they pigmented?

Mr. Jacoby: None of these resins are pigmented. All of these finishes are either urea formaldehyde or melamine formaldehyde. They are pure resin.

Mr. Springer: On these chintz finishes, for example, where they have stood up to several launderings by the American Laundering Institute, how do they stand up to the normal bleaching in processing, such as the chlorine treatment in laundering?

Mr. Jacoby: Most of these fabrics have stood twenty commercial launderings and stood up satisfactorily. I said that they have been submitted to twenty commercial launderings, but no one would expect to give these colored goods a chlorine bleach.

Mr. Springer: We were always under the impression that the melamine and urea formaldehyde resins would give chlorine retention effects.

Mr. Jacoby: My answer to that would be that a number of years ago one of the men in our company was giving a talk, and he mentioned the fact that some of the colors he was recommending were fast to chlorine in laundering, and a ton of bricks fell on him. The American Laundry Institute took exception to his remarks, stating that no laundry would treat colored fabrics with chlorine. I think that is logical reasoning. The laundries claim they do not treat anything with chlorine except all-white goods. Most of them claim even towels with colored borders are not given chlorine.

Mr. Maher: I noticed you have a dyeing in blue on acetate fabric, fast to gas fading. Was that a vat dye job?

Mr. Jacoby: I do not know the details of that technique. I just got these last week, and they were mailed to me. I wanted to ask that question myself. This is a blue, guaranteed fast to gas fading. I want to find out something about it. When a company of its reputation makes such a statement, I accept it, but like you, I am curious.

Mr. Bay: Were some of those prints discharged where the second color was put on?

Mr. Jacoby: No, they were just dyed in a few seconds so that the other color did not get a chance to get at them, and they were resisted. In other words, they were handled in such a way that they were not discharged. The print was so handled and so made that the dyeing did not affect it. You know what that pink would do to that green ordinarily. It was printed first and dyed afterwards.

Mr. Ferranti: I would like to know what the future is in photo printing?

Mr. Jacoby: Two companies started producing but both went out of business. The work is beautiful, but would have a limited market which could be saturated. Both methods are patented, and they do work. It should be a satisfactory small-volume business if one is willing to operate on that basis and not try to expand to a point where he would saturate the market.

Mr. Ferranti: Can that be done in multicolor also?

Mr. Jacoby: You are limited to two colors. This was dyed yellow and then the photagraph was printed. This is the Indigosol method.

John Murray: We in the felt industry, in our mechanical felts in particular, use tremendous quantities of reprocessed and reused woolens. Perhaps Mr. Jacoby can tell me whether any means have been developed to remove the anti-shrink qualities of woolen fabrics which have been shrink-proofed.

Mr. Jacoby: When they are treated with a resin the usual process is for the resin to be removed by acid. However, when the material is treated with chlorine, the woolen fiber is chemically altered. There is nothing that will bring it back to the condition it was in when it grew on the sheep. In that connection, it might be interesting to note the Banflame process alters the cloth. The cloth has been converted partially into a phosphoric acid ester of cellulose which makes it non-combustible. The chemical constitution has been altered, and in processes of a chemical nature where you alter the chemical composition, it is pretty tough to bring them back.

Mr. Murray: In other words, we had better watch out for chlorinated wools?

Mr. Jacoby: If you have a process that calls for felting and you get some chlorinated wool or rags, I think you are up against it, because it will not felt. You have changed your fiber.

Mr. Olson: This piece of cotton is chemically converted. What would you do to redye that?

Mr. Jacoby: The treatment is the final operation. You want to make sure you are not going to redye it after you get to that stage. You would want to do all your inspecting and everything and get it right first.

Mr. Olson: Suppose after it has been in use for a while somebody wants to change the color or change the grounds and redyes it?

Mr. Jacoby: They are going to have lots of fun. I might say that a lot of these processes are really raising havoc with by-product industries. You probably have all heard of wet-processed paper. You may have seen the paper towels which you can wash like ordinary cotton towels and use over and over again. That is done by the addition of a form of melamine resin to the beater pulp. Some of the mills that were buying waste paper got it into the beaters, in trying to rework it, and had a tough time. It had so much strength they could not pull it apart in the beater. Some makers of the wet process paper have been putting a red color along the edge to indicate that the trimmings are of the wet strength paper. A number of these processes are going to present problems to the fellow trying to rework the material.

Chairman Brennan: Mr. Jacoby, you have certainly given us a fine presentation this evening. I want to thank you on behalf of the officers and the members of A.A.T.C.C. and our guests.

Chlorination Process—

(Continued from Page P528)

4. What loss in weight occurs during the treatment? When tops are treated is regilling and recombing necessary and what waste is produced?

5. What chemical control can be exercised and will this give an accurate measure of the amount of chemicals with which the wool has reacted.

W. A. Edwards, in a recent talk, indicated that it is first necessary to determine in which stage of manufacture the wool is best treated whether in the top, yarn, fabric or made up article. Some of the points he advises checking into in selecting the process to be used are as follows:

1. Ease of manipulation and convenience to workers.

2. Productivity.

3. Initial Cost of Equipment—cost of upkeep and whether adaptable to other uses.

4. Cost of labor and materials.

5. Simplicity and degree of control.

6. Effect on other fibers.

7. Effect on other valuable properties of wool fiber, e.g. elasticity, hygroscopicity, warmth, etc.

8. Effect on colors.

I have tried to present to you an impartial discussion of the more common shrink resistant processes that employ chlorine. I would now like to tell you why Cluett, Peabody feels that the S. W. Process will best satisfy the process requirements outlined by Dr. Phillips and Mr. Edwards.

Behind this process are 30 years and more of development, more than 5 years of factory production and more than 12,000,000 pounds of wool successfully treated. Reports from enthusiastic processors have indicated excellent uniformity from batch to batch. This uniformity of reaction is attributed to the slow rate of chemical reaction that occurs at the pH at which the treatment is applied.

The S. W. Process is being applied to wool at every stage of manufacture—where past experience has indicated that it is best suited. The process requires no special equipment and can be applied in currently used dyehouse equipment.

The rate of chlorine exhaustion can be accurately followed during course of treatment by titration methods and the possibility of overtreatment has been reduced to a minimum since the reactive chemicals have been calculated in advance and are used to completion in this batch process.

Studies made on processed wool have shown a minimum loss in protein content and but little effect on dyes and other fibers as well as on the desirable proper-

ties of wool such as the hand, elasticity and warmth.

The S. W. Process is simple to apply, the chemicals used are inexpensive and readily available.

I feel that the future of washable woolens looks much brighter. I say this because someone is at last considering the plight of the consumer. Heretofore, most processes were aimed only at eliminating the felting shrinkage without any regard to the relaxation shrinkage.

The consumer, when purchasing a garment, doesn't care by which fancy name you call the shrinkage that occurs on the first wash, and his feelings are not soothed by the knowledge that the garment will not shrink on further washing. The customer demands permanent fit, at the start, after the first wash, and at the end of the useful life of the garment, and the customer is always right. Cluett, Peabody has recognized this in their promotion of the S. W. Process, and in order to meet the requirements of the "Sanforlan" trade mark, the shrinkage due to the relaxation of the yarns must be controlled within narrow limits.

It is appropriate to point out an additional factor which, in the past, has complicated the problem of making wool shrink-resistant and has up to now received too little attention and that is, that wools destined for different types of fabrics require different degrees of treatment, depending on whether the fabric structure is to be firm and tight or loose and fluffy. Now it is obvious that if all wool, regardless of its feltability or its end use, were treated hard enough to eliminate felting shrinkage from the most feltable types, a considerable portion of it would be overtreated. There would be two undesirable results of this overtreatment.

1. Some of the valuable properties of the wool would be destroyed.

2. Garments made in loose, unstable structures from overtreated wool would actually tend to stretch and lose their shape during washing. Similar allowance in degree of treatment must also be made for wool that is to be bleached subsequent to the treatment, since the action of the bleach is similar to the chlorination a milder formula is generally required.

In conclusion just one last word of caution and that is, that a washable label on a woolen article does not give one the right to abuse the article. The fastness of the dyes used and the tightness of knit must be taken into consideration in the handling of the garment.

Annual Prize Paper Award Approved By Council

AT a recent meeting in New York City, the Council voted acceptance of an annual paper prize award, offered by Howes Publishing Company, as a memorial to Alfred P. Howes.

The award, a $200.00 cash prize, will be presented to the person or persons presenting the best paper before the local sections of the association. Papers that qualify for this prize are those published in the Proceedings of the association between August 1st and July 31st, in accordance with A.A.T.C.C. rules of publication. Papers submitted in the intersectional contest of the National A.A.T.C.C. Convention and those read before other societies will not be eligible. Other conditions are to be established jointly by the association and the Howes Publishing Co. The judges will be named by A.A.T.C.C.

The award will be known as the "American Dyestuff Reporter Prize Paper Award" and will be presented at the annual National Convention. It is felt that an award of this kind will encourage the presentation of better papers before local section meetings.

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Report of Western New England Section

The last meeting of the 1948-1949 year was held May 20th at the Waverly Inn, Cheshire, Connecticut. This meeting was arranged as Ladies' Night, and in attendance were 86 members, wives, and guests.

In a program arranged for the general interest of both members and wives, Dr. Martha Johnson, manager of the Food Research and Applied Testing Laboratories of the General Electric Company, spoke on "The General Electric Consumer Institute," and Dr. Jules Labarthe, Jr., of the Mellon Institute, spoke on "Efforts of Retail Merchants to Satisfy the Consumer." Their talks were very well received, as was a group of exhibits of consumer textile items manufactured in this area, which were arranged for by a committee headed by Mr. Joseph F. Melody.

Respectfully submitted,
EDWARD A. MURRAY,
Secretary.

—♦ ♦—

Membership Applications

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B. Baxter Pearson—Branch Mgr., Monsanto Chemical Co., Portland, Ore. Sponsors: O. E. Schmidt, R. M. True.

Langdon M. Phillips—Sales Engr., Rodney Hunt Machine Co., Orange, Mass. Sponsors: E. A. Richards, H. F. Creegan.

Herbert O. Smith—Chemist, Southern Regional Research Laboratory, New Orleans, La. Sponsors: C. F. Goldthwait, W. B. Strickland.

Henry C. Speel—Chemical Engr., General Aniline & Film Corp., New York, N. Y. Sponsors: A. M. Schwartz, M. Weisberg.

Archie Tashman — Manager, Primrose Dyers, Inc., Brooklyn, N. Y. Sponsors: H. L. Steen, D. P. Knowland.

PEANUT PROTEIN FOR WINDOW SHADE SIZES

JETT C. ARTHUR, JR., and F. W. CHENG[1,2]

Southern Regional Research Laboratory[3]
New Orleans 19, Louisiana

Introduction

THE commercial utilization of proteins for making sizing materials has been principally limited to casein and animal proteins. The production of these proteins which are satisfactory for sizes was lower during 1941-46 than in previous years, and in particular the domestic production of casein has declined to less than 30 percent of pre-World War II production *(1)*. The very considerable potential quantities of vegetable proteins available from the millions of tons of meal and cake residues of the vegetable oil industry have been investigated as a source of materials for the manufacture of adhesives and sizes.

Peanut proteins for use in sizing papers have been prepared by extracting them from peanut cake by means of alkaline solvents. Results of pilot plant scale tests, using peanut protein alone or combined with rosin for paper sizing, have shown these sizes to be equal in properties and cheaper than rosin sizes *(13)*. A process for making sizing material from peanut and soybean cakes which comprises peptizing the protein in the cake by means of aqueous solutions of ammonium hydroxide or borax, clarifying the peptized liquor, and evaporating the solution to dryness has been patented. It is claimed that this material is suitable for sizing paper for lithographing *(11)*.

There are large quantities of bone or hide glues used in the manufacture of sizing materials, such as those utilized in the window shade industry. These sizes can not be dried at high temperatures, because they tend to harden thereby producing blistering and break-down of the hydrated size. Consequently, animal glue sizes require long periods of drying at low temperature. The development of a protein sizing material which can be dried at elevated temperatures should be of considerable value to window shade manufacturers.

Peanut proteins have been shown to be satisfactory for many adhesive uses *(3, 5, 7, 8, 9)*. The costs of isolating and proc-

[1] Trainee of the Ministry of Economic Affairs, Republic of China.

[2] Present address: Box 809, Georgia School of Technology, Atlanta, Georgia.

[3] One of the laboratories of the Bureau of Agricultural and Industrial Chemistry, Agricultural Research Administration, U. S. Department of Agriculture.

TABLE I
Peanut Protein Preparations

pH of extraction (NaOH)	*pH of precipitation (SO_2)*	*Treatment of isoelectric curd*	*Temperature of drying, °F.*	*Analyses of protein*[a] *Nitrogen, %*	*Ash, %*
7.5	4.5	None	120	16.2	0.68
7.5	4.5	Neutralized to pH 6.5 by NaOH	120	16.1	3.63

[a] Calculated on a moisture-free basis.

TABLE II
Protein Size Formulations

Formula No.	*Protein dispersed in NaOH solution* *Type*	*Concentration %*	*Other chemicals*	*pH*	*Viscosity (centipoise)*	*Temperature of drying sized muslin, °C.*
1M-1[a]	Animal glue size	16.5	Twitchell 0.1, 10% on protein basis	7.7	71	23-25
9[b]	neutralized peanut	16.5	Twitchell 0.1, 10% on protein basis	6.5	5	23-25
15	neutralized peanut	20.0	Twitchell 0.1, 10% on protein basis	6.4	6	23-25
18	neutralized peanut	20.0	.....	6.4	7	23-25
20	peanut	20.0	.....	7.4	6	23-25
22	peanut	20.0	.....	8.8	7	23-25
23	peanut	20.0	.....	9.5	6	23-25
24[c]	peanut	20.0	.....	9.6	7	23-25
26[c]	peanut	20.0	.....	9.7	6	23-25
28	peanut	20.0	.....	7.1	6	60
30	peanut	20.0	.....	7.1	6	100

[a] Typical commercial formulation.
[b] See Table I for preparation of neutralized protein.
[c] Protein dispersed in NH_4OH solution.

TABLE III
Effect of Size Formulations on Tensile Properties of Cotton Muslin (64 x 60)[a]

Formula No.	*Breaking Strength* *Warp, lb.*	*Filling, lb.*	*Elongation* *Warp, %*	*Filling, %*	*Tearing strength* *Warp, lb.*	*Filling, lb.*
M-1[b]	40	27	9.3	12.3	3.4	2.2
M-2[c]	43	20	7.7	15.0	4.0	1.9
SM-1[d]	53	40	9.3	9.3	3.0	1.2
1M-1[e]	60	33	9.0	12.0	4.6	1.5
9	47	30	9.0	16.3	3.0	2.0
15	50	28	8.7	14.3	3.0	1.8
18	46	29	8.7	16.0	3.5	2.1
20	50	35	9.7	13.0	3.5	2.4
22	54	28	8.7	12.0	3.5	1.5
23	53	28	8.3	11.7	3.5	1.5
24	54	23	7.3	11.3	3.3	2.5
26	53	22	7.7	11.7	2.8	2.5
28	51	22	7.7	25.7	2.6	2.3
30	53	23	7.7	24.7	3.8	2.0

[a] Size applied at a rate of 0.036 lb./sq. yd. of muslin.
[b] Unsized muslin used in tests No. 1 through 23.
[c] Unsized muslin used in tests No. 24 through 30.
[d] Commercially sized sample using animal glue, hand application.
[e] The numbers refer to those given in Table II.

TABLE IV

Effect of Temperature of Drying on the Properties of Muslin Sized with Peanut Protein

Test	Samples sized with peanut protein and dried at different temperatures[a]		
	No. 20, 25°C.	No. 28, 60°C.	No. 30, 100°C.
Breaking strength, Warp, lbs.	50	51	53
Filling, lbs.	35	22	23
Tearing strength, Warp, lbs.	3.5	2.6	3.8
Filling, lbs.	2.4	2.3	2.0
Elongation, Warp, %	9.7	7.7	7.7
Filling, %	13.0	25.7	24.7
Stiffness, bending moment, inch-lbs. x 10^{-4} angular deflection			
5°	14	14	12
10°	25	25	26
20°	46	54	53
30°	58	73	73
40°	66	81	82
50°	70	83	89
60°	72	83	90
50°	27	32	34
40°	12	14	14
30°	1.2	2.5	2.5
25°	0	0	0

[a] The numbers refer to those given in Table II.

essing peanut protein compare favorably with those for producing other industrial proteins *(6)*, and the potential qualities of peanut proteins for industrial utilization are large. For these reasons an investigation was made of the conditions under which peanut protein could be used as a sizing material.

Experimental

ISOLATION OF THE PROTEIN.—Oil-free peanut meal, obtained by removing the oil by means of *n*-hexane as described in a previous publication *(12)*, was the source of protein used in this investigation. The technique of isolating peanut protein was similar to that described by Arthur, *et al. (2)*. The details of preparation and analysis of the proteins are given in Table I.

METHOD OF TESTING.—Unsized cotton muslin (64 x 60) was sized in a padder with the temperature of the sizing solution maintained at 50° C. Eighteen-inch widths of muslin were fed into the padder. From the padder the sized muslin passed through squeeze rolls adjusted to control the amount of size retained by the muslin. The sized muslin was put on frames without any tension being applied to the cloth and dried at the desired temperatures.

The viscosity of the sizing solutions were determined by means of the Hoeppler rolling ball viscometer *(10)*. The *p*H values of the solutions were determined by means of a glass electrode meter without the correcting for the salt effect.

The breaking and tearing strengths of the dried, sized muslin were determined by the A. S. T. M. raveled-strip and trapezoid methods, respectively *(4)*. The stiffness of the sized muslin was evaluated by means of testers which use the principal of cantilever bending.

TABLE V

Effect of pH of Size Solution on the Properties of Muslin Sized with Peanut Protein

Test	Samples sized with peanut protein and dried at 25°C. and size applied at different pH of solution[a]		
	No. 20, pH 7.4	No. 22, pH 8.8	No. 23, pH 9.5
Breaking strength, Warp, lbs.	50	54	53
Filling, lbs.	35	28	28
Tearing strength, Warp, lbs.	3.5	3.5	3.5
Filling, lbs.	2.4	1.5	1.5
Elongation, Warp, %	9.7	8.7	8.3
Filling, %	13.0	12.0	11.7
Stiffness, bending moment, inch-lbs. x 10^{-4} angular deflection			
5°	14	9.5	13
10°	25	20	24
20°	46	43	48
30°	58	58	68
40°	66	68	82
50°	70	75	89
60°	72	78	94
50°	27	32	38
40°	12	12	17
30°	1.2	2.5	4.2
25°	0	0.5	0

[a] The numbers refer to those given in Table II.

Results and Discussion

The required properties for a sizing material for use in window shade manufacture are flexibility, smooth finish, and freedom of deleterious effects on the tensile properties of the cloth. Several protein size formulations are given in Table II. It is evident that the viscosity of the peanut protein solutions are uniformly low and that the viscosity of animal glue solution is higher. In these tests, controlled amounts of size were retained by the muslin.

The effect of the type of sizing solutions on the tensile properties of the cloth are shown in Table III. The peanut protein sizes gave uniformly higher elongations of the filling at break as compared with the commercially sized sample, although compared with the samples sized with animal glue which were prepared during these tests there were no significant differences.

The effects of the rate of drying on the properties of samples sized with peanut protein are shown in Table IV. The elongation at break was increased as the temperature of drying of the samples was increased. The stiffness of the sized samples also increased as the temperature of drying was increased.

The effect of the *p*H of the peanut protein size solutions on the flexibility of the size is shown in Table V. Cotton muslin sized with protein solutions having higher *p*H values were less flexible, as indicated by the values for stiffness.

A comparison of a sample of cotton muslin sized with animal glue which was obtained from a commercial firm with a sample sized in the laboratory with peanut protein is made in Table VI. It is seen that the tensile properties and flexibility of the samples are very similar.

Summary

Cotton muslin sized on a laboratory scale with peanut protein solutions has tensile and flexibility characteristics similar to commercially sized samples using animal glues. Peanut protein appears to be applicable as a sizing material for use

in window shade manufacture and similar applications.

Acknowledgment

The authors wish to thank Dr. Ruby K. Worner, Leila D. Wiggins, Dorothy C. Legendre, and Vidabelle O. Cirino of the Analytical, Physical Chemical, and Physical Division for the analytical data on the isolated protein and the properties of the sized cotton muslin.

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TABLE VI

Comparison of Properties of Muslin Commercially Sized with Animal Glue and of Muslin Sized with Peanut Protein

Test	*Commercially sized SM-1*[a]	*Peanut protein sized No. 20*[a]
Breaking strength, Warp, lbs.	53	50
Filling, lbs.	40	35
Tearing strength, Warp, lbs.	3.0	3.5
Filling, lbs.	1.2	2.4
Elongation, Warp, %	9.3	9.7
Filling, %	9.3	13.0
Stiffness, bending moment, inch-lbs. x 10^{-4} angular deflection		
5°	12	14
10°	23	25
20°	41	46
30°	54	58
40°	64	66
50°	68	70
60°	74	72
50°	30	27
40°	13	12
30°	2.5	1.2
25°	0	0

[a] The numbers refer to those given in Table II.

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TRADE NOTES • NEW PRODUCTS

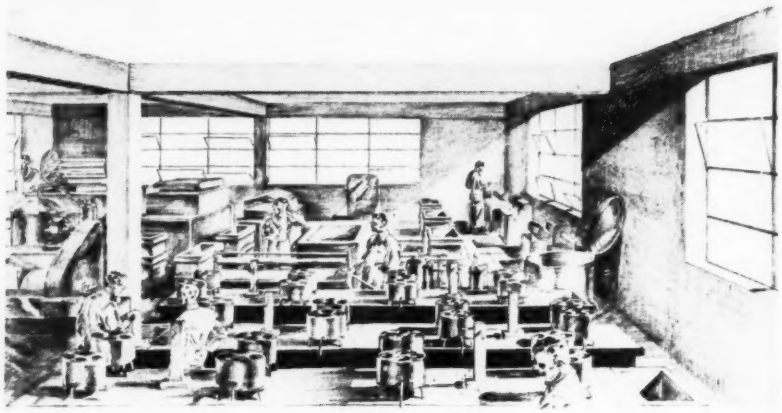
• Scholler Gift to PTI

A gift to The Philadelphia Textile Institute Foundation by the Scholler Foundation, Philadelphia, in the amount of $120,000.00 was announced recently by Col. Millard D. Brown, President of the Foundation.

This gift, one of the largest ever received for textile education, was presented to the Foundation by Dr. Fred C. Scholler, President, Scholler Brothers, Inc. and a Vice President of The Philadelphia Textile Institute Foundation.

Eighty thousand dollars of this gift will be used to build and to equip the entire Dye Laboratory of the new Philadelphia Textile Institute at School House Lane and Henry Avenue, Germantown. This Dye Laboratory of 5,500 square feet will house not only the equipment to be moved from the old school at Broad and Pine Streets, but also $15,000.00 worth of new equipment.

Presentation Ceremonies at PTI. L. to R.—Col. Millard D. Brown, President; Bertrand W. Haywood, Director; Fred C. Scholler.



Sketch of Scholler Dye Lab.—Interior View

The remaining $40,000.00 of this gift will be used towards the $150,000.00 still needed for the purchase of scientific instruments and additional modern machinery required by the Institute in its new and enlarged quarters.

The Dyeing Department of the Philadelphia Textile Institute is one of the oldest of its kind in the country having had its inception in the eighteen eighties. During the first world war when the dyestuff importation was reduced to almost zero, the Philadelphia Textile Institute supplied many of the dyestuff manufacturers with numerous authentic German dye samples, from the school's large collection, which were of material aid in helping the industry to duplicate and to improve dyestuffs formerly imported only from Germany.

• Wrinkl-Shed Finish On Gingham

For the first time a successful wrinkle-resistant finish has been applied in volume to lightweight cotton gingham, it was announced by John Hughlett, Vice-President and General Sales Manager of Dan River Mills. The Starspun Gingham line will carry the Wrinkl-Shed finish throughout when it is presented for the cruise wear lines about July 15th, and will be available for delivery starting in August.

The Wrinkl-Shed process for lightweight cottons is expected to create an unprecedented demand for many types of garments.

In addition to its wrinkle-resistant qualities, it is claimed the new Wrinkl-Shed Starspun Gingham will have less than 1 per cent shrinkage instead of the former 3 per cent. The Wrinkl-Shed finish is said also to impart a certain degree of soil resistance which, in combination with the wrinkle-resistance, means that a garment can retain its fresh appearance considerably longer.

Since Wrinkl-Shed application fuses with the cotton fibers, it is a lasting finish which is said to survive repeated launderings. As a further value, this finish has been so perfected on Starspun that it is claimed to be completely imperceptible. It is stated that it does not change the hand or appearance of the fabric nor does it alter any of its desirable qualities or characteristics.

The application of Wrinkl-Shed to Starspun, largest volume fabric of Dan River's cotton dress goods line, is said to represent an achievement which is the result of considerable experimentation. Dan River is continuing to experiment with other lines and, eventually, expects all lightweight fabrics in its cotton dress goods line to carry the wrinkle-resistant finish.

• Textile Conferences

A series of textile conferences sponsored by state universities will be held in Colorado, Idaho, Oregon and Washington this summer under the direction of Dean Simon Williams, Lowell Textile Institute of Massachusetts, the Textile Information Service announced.

The conferences are designed to provide factual and useful information about textile industry to consumers, manufacturers, retailers, sales personnel, producers of raw materials, dry cleaners and launderers, in addition to the students and faculties of the sponsoring schools. Dean Williams' programs include lectures, discussion classes, demonstrations and exhibits of particular educational value in sections distant from the textile manufacturing areas.

G. Ellsworth Huggins, chairman of the Textile Committee on Public Relations, who was instrumental in arranging the conferences, says the first one held at the University of Idaho last summer as a feature of a six weeks lecture course conducted by Dean Williams resulted in the committee offering the same services to other institutions this year. Two other western universities, Missouri and Illinois, unable to fit the conference into their summer schedules this year, have requested the conference for 1950.

First of the conferences was held July 6 and 7 at the University of Denver in Colorado. The next has been arranged for the University of Idaho in Moscow, July 18 through July 22.

In Portland, where the third conference will be held August 3 and 4, the Oregon State System of Higher Education, which represents the five state institutions, will sponsor the event. The final conference has been scheduled for the University of Washington in Seattle, August 8 and 9.

In his lectures, Dean Williams discusses the how, where, why and what of today's fabrics. His talks center about the problems of one of the world's largest industries in an effort to bring industry and society into closer understanding. He also discusses the processes used today which give natural and synthetic fibers new and unique properties for present day living; merchandising, the influence of color, style and the handling of textiles for maximum satisfaction to the consumer.

• New Metropolitan Sales Manager

Louis J. Dogin has been promoted to Sales Manager of the Metropolitan Force of American Aniline Products, Inc., according to the announcement made at the company's Main Office by George L. Armour, Executive Vice-President.

Mr. Dogin, a resident of Nutley, New Jersey, had been a salesman in the New York area for American Aniline Products, Inc. for over 20 years. In his new duties, with headquarters at 50 Union Square, New York City, he will supervise the company's sales efforts in New Jersey, Greater New York and Long Island.

Louis J. Dogin

• New Sterling Lixator

A new model Lixate Rock Salt Dissolver that features several major improvements over the previous type has just been developed by International Salt Company, Inc. Based upon the company's years of experience in designing these units to meet all varieties of plant conditions, this model, called the Sterling Model Lixator, is made of durable stainless steel that is said to last a lifetime. In addition, it contains structural changes that make it even easier to use than the previous model.

One of the major improvements on the Sterling Model is the fact that it rests on 2-inch pipe legs that are furnished in short lengths so that the unit will be as low as possible to the floor in order to permit easier filling with rock salt. The height of the Lixator may be easily changed to suit rearrangement of other equipment by attaching different lengths of 2-inch pipe to the couplings at the bottom of the Lixator.

A second improvement eliminates the nozzle at the extreme bottom of the previous Detroit model Lixator and introduces two nozzles for flushing water located within the unit in such a way that they greatly simplify the periodic task of cleaning the interior of the dissolving tank of its rock salt filter bed and of the insoluble particles that have been filtered out of the brine.

Sterling Model Lixator

These changes in basic design, combined with the stainless steel construction, are said to facilitate plant operation and further simplify the already simple and economical method of Lixate brine production. Because the Lixator automatically produces saturated, pure, crystal clear brine from rock salt, the company reports that its use has consistently reduced the cost of salt handling and brine production in any plant that installs it.

OBITUARY

ALBERT H. GRIMSHAW

Funeral services for Prof. Albert H. Grimshaw, 65, of the Mansion Park Hotel, Raleigh, N. C., who died of a heart ailment at Rex Hospital Wednesday night, April 20, were held at Yelverton's Funeral Home in Raleigh Thursday afternoon, April 21. The Rev. Ray Holder, rector of Christ Church in Raleigh, officiated. Interment was in the North Burial Ground in Providence, R. I., Friday afternoon, April 22, at 2:30 p.m.

A native of Providence, Professor Grimshaw was a member of the faculty in the School of Textiles at State College for 24 years, joining the institution's staff in 1925. He was head of the Department of Chemistry and Dyeing for many years until his retirement from that position several months ago.

He conducted extensive research in the field of textiles and wrote articles for virtually every textile trade journal in the United States.

He was a member of the American Association of Textile Chemists and Colorists, the American Association for the Advancement of Science, the American Institute of Chemists, and a number of honorary societies such as Blue Key, Phi Kappa Phi, Sigma Tau Sigma, Delta Kappa Phi, and Gamma Sigma Epsilon.

The college chapter of Delta Kappa Phi, the professional textile society, honored Professor Grimshaw at a dinner last November and presented a large portrait of him to the college. The portrait now hangs in the School of Textiles at the college.

Professor Grimshaw was educated at the Massachusetts Institute of Technology, Columbia University, N. C. State, and the New Bedford, Mass., Textile Institute.

He had been in declining health for several months and had been a patient in Rex Hospital suffering from a heart ailment since April 7.

Surviving are his widow, Mrs. Bertha Grimshaw; a son, Dr. Austin Grimshaw of the University of Illinois; a sister, Miss Margaret Grimshaw of Somerville, Mass.; two grandchildren; and one great grandchild.

Albert H. Grimshaw

• Gruber Awarded M.I.T. Fellowship

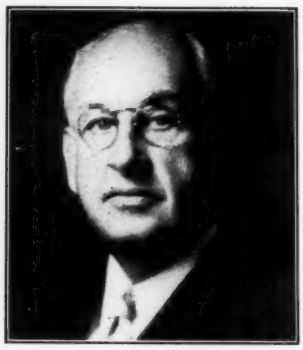
New England Textile Foundation, 68 South Main Street, Providence, Rhode Island, has announced that its first fellowship, at Massachusetts Institute of Technology, for post-graduate work, had been awarded to Philip A. Gruber, a graduate of Lowell Textile Institute, Lowell, Massachusetts, in June of this year. The fellowship provides a grant of $1800.00 for one year to cover tuition and living expenses and is subject to renewal for a second year.

Mr. Gruber will specialize in textile technology. He is single and at present a resident of Lowell, Massachusetts. Graduating from Lowell High School in 1942, he entered Lowell Textile Institute in the same year. Upon completion of the freshman year at the Institute, he transferred to Tufts College in the V-12 Program, remaining there for three semesters. From Tufts he was ordered to Midshipman School at Northwestern University where he received his commission as an ensign in November 1944, later being promoted to lieutenant, junior grade. He also attended General Line Officers School in Miami and Communications School at Harvard.

Released to inactive duty in 1946 he returned to Lowell Textile Institute and was appointed student instructor in Quantitative Analysis in September 1947. He received his B.S. degree in Textile Chemistry.

In addition to being an honor student, Mr. Gruber is a member of Tau Epsilon Sigma, honor fraternity and Omicron Pi fraternity; also the American Association of Textile Chemists and Colorists.

His practical experience includes a summer of work, 1947, in the Research Division of Calco Chemical Company, Bound Brook, New Jersey and a summer, 1948, with the Bradford Dyeing Association (U.S.A.), Bradford, Rhode Island.



Hervey J. Skinner

William W. A. Johnson

• N.E. Spectrochemical Buys

The New England Spectrochemical Laboratories of Ipswich, Mass., has purchased the outstanding stock of Skinner & Sherman, Inc., of Boston, Mass., New England's largest and oldest firm of analytical chemists and bacteriologists. This corporation, which took over the Boston Biochemical Laboratory in 1921, has for the last thirty years been listing among its services for industry and the public chemical and physical testing of metals, minerals, paper, rubber, leather, asphalt and cement; bacteriological examination of water, food, beverages and medicinals; and the establishment of technical control in manufacturing. It is an approved laboratory for testing wood pulp, denaturants, floor polishes and cleaners.

Hervey J. Skinner, recently honored for his fifty years of membership in the American Chemical Society, continues as President; Herbert L. Sherman and Burton G. Philbrick as Vice-Presidents. William W. A. Johnson of New England Spectrochemical Laboratories has been elected Treasurer. The new Board of Directors includes Albert H. Bump, Monsanto Chemical Co.; Kenneth R. Fox, President, Lowell Textile Institute; Thomas R. P. Gibb, Jr., Director of Research, Metal Hydrides, Inc.; Daniel P. Norman, New England Spectrochemical Laboratories; Arnold C. Rood, Kent and Rood; and the officers.

While complementing and increasing the scope of the services they offer to industry and the public, the two organizations will remain separate, and all communications should be addressed to each as in the past.

As a result of this purchase, New England Spectrochemical Laboratories will now offer to its clients a completely integrated consulting and research service in the fields of bacteriology and biochemistry as well as in chemistry and physics, it is claimed. Skinner and Sherman, Inc. will offer as regular services the newest techniques in chemical and physical analysis developed in the research organization of New England Spectrochemical Laboratories, thus making available the most modern and complete analytical and testing services in the country.

• Stowe-Woodward Opens New Plant

The new Stowe-Woodward "Ward" plant was officially dedicated and pronounced in operation by Embert W. Peterson, President of Stowe-Woodward, Inc. (manufacturers of rubber rolls for the paper, textile and other industries) at Newton Upper Falls, Massachusetts on June 9th before directors and officers of the company, the mayor of Newton and other guests and employees.

This new plant, adjoining the present company buildings on Oak Street at the Charles River, is a completely equipped, self-sufficient factory for the manufacture of rubber covered rolls.

While the plant is completely modern in every particular, perhaps of greatest interest to the visitors from many states who were present at the dedication ceremony was the new specially designed single wheel rubber roll grinder built by Farrel-Birmingham Company, Inc., of Ansonia, Connecticut. This equipment, longest and largest of its type in the United States, is the first and so far the only grinder built by Farrel-Birmingham which possesses all its features and improvements.

Designed and equipped to process rolls larger than any in current use and to be adequate for any service within the foreseeable future, the Ward Plant has installed a number of other major pieces of equipment.

For electric power, Stowe-Woodward have installed their own transformer substation, which consists of three 333 KVA single phase transformers, to provide 1000 KVA power at 440 volts, 3 phase, 60 cycles.

Every consideration has been given to facilitate the flow of traffic both within and into the plant from outside. Shipping doors have been designed to accommodate the largest motor trucks and are the electrically-operated, steel roll-up type.

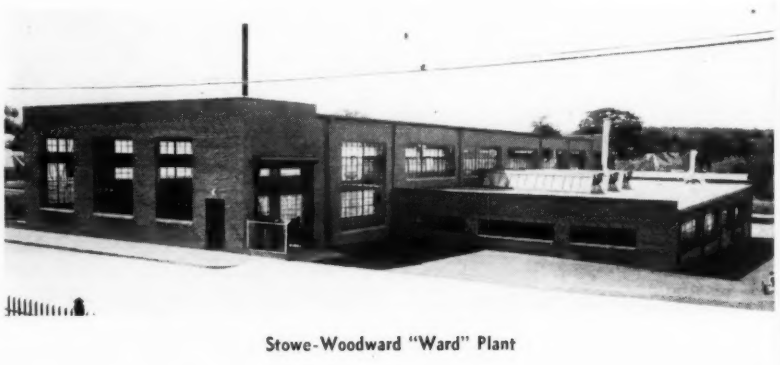
• Data Sheets Available

The W. C. Hardesty Co., Inc., 41 East 42nd Street, New York 17, N. Y., has available a set of data sheets, which sets forth in easy-to-read chart form the specifications and respective solubility in oils, solvents and waxes of various molecular weight Polyethylene Glycol Mono and Di Stearates, Laurates and Oleates, and also various Glycerol and Glycol Esters of Fatty Acids. This information and samples are obtainable at no charge on request.

• Scholler Receives D. Sc.

Fred C. Scholler, president of Scholler Brothers, Inc., one of the nation's largest manufacturers of textile chemicals and producers of the Schollerizing wool shrinkage controls, received an honorary degree of Doctor of Science, at La Salle College, June 15th.

The degree was conferred at the school's commencement exercises in recognition of his work in the field of textile chemistry and his interest in the education of students seeking careers in the textile sciences.



Stowe-Woodward "Ward" Plant

Dr. Raymond L. Copson

• Copson Appointed

Dr. Raymond L. Copson has been appointed Director of Research of the Mutual Chemical Company of America as of July 1st with headquarters in Baltimore. Dr. Copson was formerly Director of Research for the Rumford Division of the Heyden Chemical Corporation.

During and prior to the last war, Dr. Copson was chief of research and engineering for the Tennessee Valley Authority, a major producer of phosphorus and ammonium nitrate. He is the author of a number of papers on phosphate technology and other branches of inorganic chemistry. He is a member of the American Institute of Chemical Engineers, the American Chemical Society, and the Chemists' Club, N. Y. He holds degrees from Worcester Polytechnic Institute and Yale University.

• Sales Department Transfer

Central Sales Development Department of General Aniline & Film Corporation has transferred its offices from 247 Park Avenue, New York City, to 22 Centre Square, Easton, Pa. The department, which is headed by Dr. Philip M. Kirk, is now included in the Research and Development Division of the company.

• Committee Chairmen Appointed

Robert B. Magnus (Magnus, Mabee & Reynard, Inc.) Chairman of the DCAT, has announced the following chairmen to head committees for the 59th Annual Meeting of the Drug, Chemical and Allied Trades Section of the New York Board of Trade, to be held at Shawnee Inn, Shawnee-on-the-Delaware, Pa., on September 23rd and 24th:

Banquet Committee—L. I. Volckening, (The Ivers-Lee Co.); Business Program Committee—Fred J. Stock (Chas. Pfizer & Co., Inc.); Evening Entertainment Committee—Charles P. Walker, Jr. (Citro Chemical Company); Golf Committee—Harold C. Green (L. Sonneborn Sons, Inc.); Greetings Committee — Carle M. Bigelow (Calco Chemical Division American Cyanamid Co.); Ladies' Card Party Committee—Chas. M. Macauley (Pro-phylac-tic Brush Co.); Ladies' Golf Committee—Mrs. Mel C. Eaton; Memorials Committee—Wm. S. Auchincloss (Oil, Paint & Drug Reporter); Miscellaneous Sports Activities—Claude A. Hanford (Pharmaco, Inc.); Publicity Committee—Ira P. MacNair (MacNair-Dorland Co.); Transportation Committee—Robert L. Hutchins (Commercial Solvents Corporation); Reception Committee—Clark L. Rodgers (Owens-Illinois Glass Co.); Registration Committee—J. P. Remensynder (Heyden Chemical Corp.).

• Jones New Plant Manager

Leland M. Jones, a member of the Du Pont Company's rayon organization for 16 years, has been appointed plant manager of the "Orlon" acrylic fiber plant which is now under construction at Camden, S. C. He is planning to establish headquarters there in the fall. Manufacturing operations are scheduled to begin the latter part of 1950.

A native of Green Valley, Va., Mr. Jones is 46 years old. He attended high school at Covington, Va., and studied at the Fork Union, Va., Military Academy before attending Virginia Military Institute, where he was graduated in 1925 with a bachelor of science degree in civil engineering.

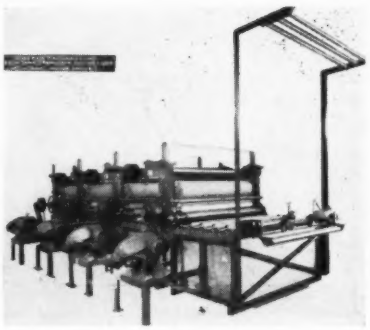
He was maintenance supervisor and works engineer at Richmond before he was transferred to the new "Orlon" acrylic fiber organization in 1947.

• Becco Improvement Made Available

An improvement in the Becco Continuous Bleaching Process is being made available to the textile industry by the Buffalo Electro-Chemical Company, Inc. on a royalty-free basis.

Described in U. S. Patent No. 2,391,905, this improvement involves introduction of hot water into the curved section of the J boxes, which acts as a lubricant for cloth and helps to maintain a clean stainless steel surface. Benefits claimed include easier washing, cleaner cloth, and freer passage of the cloth through the J-box.

This system has been field-tested and is now in regular use on a number of continuous bleaching ranges. Enthusiastic reports are said to have been received about its performance.



4-Tank Open Width Washer

• New Processing Machine

The Cook-P. & N. Machine Company, Inc., of Boston announces a 4-tank open width processing machine with individual motor drives, a complete machine of fabricated construction said to eliminate casting failures and replacements.

Features include frames, roll standards, etc. of mild steel with the remainder of the machine completely of stainless steel; bottom squeeze rolls of stainless steel and rubber covered top rolls, both revolving on self-aligning ballbearings; applied pressure through a diaphragm with automatic means of raising the top roll when air is shut off; radial type compensators which automatically adjust motor speeds to maintain required tension on cloth; stainless steel head and shaft equipped guide and immersion rolls; and a stainless steel spiral roll preceding each pan of squeeze rolls.

The machines can be made with any number of tanks in all widths and all combinations.

The entering end is arranged with overhead guide rails and guider. The drive is through direct current motors supported on bases above floor level, and vee belt drives to American reduction pulleys on each end of each bottom squeeze roll. Driving can be arranged with motors directly connected to the bottom rolls, too, it is claimed.

• Edwal Addendum

The Edwal Laboratories regret that a recent announcement failed to give the retail price schedule of commercial grade phloroglucinol.

The retail net price is $5.50 per pound in 100-pound lots and $6.00 per pound in smaller quantities F.O.B., Ringwood, Illinois.

Phloroglucinol has gained wide acceptance as a developer for acetate black dyes, giving a color which is said to have good light and wash fastness.

• Committee On Rayon Fabrics Organized

Twenty-seven national organizations of manufacturers of rayon fabrics, retailers who sell rayon materials to the public, users, technical experts and government departments met in New York June 16 and organized a Committee on Rayon Fabrics to develop a series of performance standards for rayon fabrics for different uses. The committee is planning that its work will give information that will make it possible for anyone to tell whether the rayon material or the rayon fabric in the ready to wear article she is buying is suitable for a dress, for a bathing suit, for upholstery materials, for a man's shorts, or a woman's evening gown.

The committee met under the chairmanship of J. D. Runkle, vice-president and general manager, Crowley-Milner Company, Detroit. Mr. Runkle represents the National Retail Dry Goods Association which is sponsoring the project under the procedure of the American Standards Association. Gordon K. Creighton, assistant general manager, National Retail Dry Goods Association, is vice-chairman of the committee. George G. Sommaripa, of the consumer goods division of the American Standards Association has been appointed secretary of this group.

At its organization meeting, the committee agreed on a scope for its work and on four initial subcommittees that will start the project. For the Committee's purpose the term "rayon" is to be understood to include those fibers that are derived from a cellulose base regardless of what process is used in their manufacture. The work itself will include "The development of specifications, test methods, and performance requirements for rayon fabrics (containing more than 50 percent of rayon) used in the manufacture of such products as men's wear, women's wear and home furnishings; and the development of uniform methods of collecting samples for compliance tests; and the establishment of methods of promoting the use of specifications, test methods and performance requirements for rayon fabrics through suitable certification and labeling procedures."

As a basis for this work, the American Viscose Corporation has made available the results of its 19 years' research on standards of performance of rayon fabrics.

Four subcommittees were named at the meeting and chairmen appointed:

Women's Wear: H. G. Leef, Merchandise Manager, Woodward & Lothrop, Washington, D. C.

Men's Wear: Fred C. Strodel, Vice-President, The Fair Store, Chicago, Ill.

Home Furnishings: A. G. Lewi, Vice-President, Bamberger, Newark, N. J.

Administrative: Gordon K. Creighton, Assistant General Manager, National Retail Dry Goods Association, New York.

It is planned that the first work to be undertaken will be:

For men's wear: Sports shirts, both woven and knitted.

For women's wear: Dressing gowns, lounging pajamas, negligees, nightgowns, pajamas, and underwear, both woven and knitted.

Home furnishings: Woven window curtains.

For the administrative committee: Start planning its work on general problems.

All groups particularly concerned with the subject of one of the subcommittees will have an opportunity to take part in the technical work on a proposed standard.

In his opening address to the members of the committee, Mr. Runkle challenged all the groups concerned to make their work so effective that it will "demonstrate to the whole country that we are capable of self-regulation" and "strengthen our position as free enterprisers in our relations with the government and public."

"It is not this or that set of standard technical provisions that may be considered by this committee that is at stake," he said. "What is at stake and what is on trial is the ability of free enterprise to respond to the need of the buying public for informative labeling and minimum requirements for the rayon industry. The rayon industry, young and modern, is fully aware that the public demand is of paramount importance to its success and progress."

The organizations represented at the meeting were:

American Assn. of University Women
American Assn. of Textile Chemists & Colorists
American Council of Commercial Laboratories
American Home Economics Assn.
American Hospital Assn.
American Institute of Laundering
American Retail Federation
Association of Buying Offices, Inc.
Congress of Industrial Organizations
Cooperative League of the U. S. A.
Limited Price Variety Stores Assn., Inc.
Mail Order Assn. of America
National Assn. of Finishers of Textile Fabrics
National Consumer-Retailer Council, Inc.
National Federation of Textiles, Inc.
National Institute of Cleaning & Dyeing
National Retail Dry Goods Assn.
Rayon Yarn Producers Group
Silk & Rayon Printers & Dyers Assn. of America, Inc.
Textile Distributors Institute, Inc.
Textile Fabrics Assn.
Underwear Institute
U. S. Dept of Agriculture—Bureau of Human Nutrition and Home Economics
U. S. Dept. of Commerce—National Bureau of Standards
U. S. Dept of Labor—Bureau of Labor Statistics
U. S. Dept. of the Navy—Bureau of Supplies & Accounts
U. S. Dept. of the Navy—Marine Corps
United Textile Workers of America—American Federation of Labor

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• Russell Elected

George W. Russell, Assistant Sales Manager of American Cyanamid Company's Industrial Chemicals Division, was elected President of the Chemical Market Research Association at that organization's Annual Business Meeting held in the Hotel Biltmore, New York City, on June 9, 1949.

Mr. Russell, who has been active in new product development and market research for a number of years, has been a member of the organization since 1947 and during the past two years has served as Chairman of the Publications Committee and the Program Committee.

The Chemical Market Research Association was organized in 1940 and its membership consists of market research specialists from about 90 leading chemical companies of the United States and Canada. The objectives of the organization are the advancement of chemical market research in theory, practice and application, and the maintenance of high professional and ethical standards among its members.

• Nopco Soap C

Nopco Soap C is claimed to be a new low cost, low titer running about 15° C., completely water soluble soap now being offered by Nopco Chemical Company, Harrison, New Jersey. It is a fine, light tan powder, with a 97 per cent activity. Chemically it is described as the sodium soap of a mixture of unsaturated aliphatic and resin acids.

The product is proving interesting for a variety of industrial uses. Primarily, it is said to be an ideal detergent for use with alkaline salts in the preparation of metal cleaning, floor cleaning and heavy duty cleaning compounds.

In the textile field Nopco recommends it for use in wool scouring, and in paper manufacture as a lubricant and plasticizer for coating formulations.

CALCO dyelines

No. 9 of a series

PUBLISHED BY AMERICAN Cyanamid COMPANY CALCO CHEMICAL DIVISION
Bound Brook, New Jersey
New York • Chicago • Boston • Philadelphia • Charlotte • Providence

WORK CLOTHING ACQUIRES ATTRACTIVE COLORS

It is estimated that over twenty-five million men use work clothing, and almost fifty percent of the nation's working population — farmers, production workers, miners, mechanics, etc.—require special clothing for their daily occupations. Sales of work clothing totaled more than $390,000,000 last year, almost a third of the entire men's and boys' clothing industry.

Once it was considered standard practice to dye cotton work clothing with Indigo. More recently, large

quantities are being dyed with various other vat dyes and with sulfur dyes, permitting a variety of shades rather than just the monotonous blue.

Large yardages of work clothing are still manufactured from overall denims woven from warp yarns dyed with Indigo and from filling yarns which are white, or Indigo-dyed, or tinted with vat dyes. Other considerable quantities are dyed with sulfur black, the cotton being stock-dyed with sulfur black and spun into yarn. This black-dyed yarn, along with white yarn in various combinations, is then woven into sturdy fabrics such as covert cloth. Work pants are also sometimes made from moleskin printed with a small white resist pattern and dyed with aniline black.

All of these operations date back many years, while vat-dyed work clothing in more attractive colors is comparatively new. Work pants, matched shirt and pants sets, and one-piece uniforms are now available in various colors. To meet fastness requirements, only the best vat dyes can be used, and they must be applied skillfully. They must withstand sunlight, vigorous power-laundering, dry cleaning, perspiration and repeated abrasive wear by persons in active physical labor.

Dyehouse costs can be kept low, and uniformity of shade can be maintained at a high standard by continuous processes which, using highly perfected and accurately standardized vat dyes, deliver 50,000 or more yards of dyed cloth per machine per eight-hour day. Typical work clothing shades such as tan, khaki, gray, postman blue, sage green, navy, black, can be produced with combinations of the following Calco dyes:—

Calcosol* Black DDB
Calcosol Navy Blue
Calcosol Dark Blue BO
Calcosol Brown R
Calcosol Brown BR
Calcosol Brown G
Calcosol Copper Brown
Calcosol Khaki G
Calcosol Olive Green BN
Calcosol Jade Green N
Calcosol Golden Orange GD
Calcosol Golden Orange RRTD
Calcosol Flaming Orange 2R
Calcosol Red BN
Calcosol Violet BN Extra
Calcosol Violet 4RP Extra
Calcosol Yellow G
Calcosol Fast Yellow
Calcoloid* Direct Black JD
Calcoloid Gray 2G
Calcoloid Blue BLD
Calcoloid Yellow GCD

For pigment padding of any of these recommended dyes, the Calcosol* or Calcoloid* pastes or the Calcoloid powders can be used. *TRADEMARK

FOR THE TEXTILE BOOKSHELF

Calco Technical Bulletin No. 807—*"Dyeing Studies at Elevated Temperatures"* by G. L. Royer and C. L. Zimmerman, Calco Research Department, and H. J. Walter and R. D. Robinson, Bachmann Uxbridge Worsted Corporation, Uxbridge, Mass.

The Research Department of the American Cyanamid Company, Calco Chemical Division, began in 1941, a cooperative investigation with the Bachmann Uxbridge Worsted Corporation on a fundamental study of the dyeing of wool and wool-cotton unions at high temperatures under pressure. This was based on the concept of continuous dyeing at high temperatures under pressure by H. J. Walter, President of Bachmann Uxbridge. The bulletin reports methods developed for dyeing textile fibers at temperatures in the range of 200° F. to 300° F.

22 million gallons of water circulate through Calco every 24 hours.

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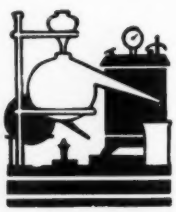

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REPLACES soap or portion of your Soap—for SCOURING piece goods, Cotton, Wool, Rayon, Acetate or Nylon.

Brighter colors due to the
PENETRATING and LEVELING
qualities.

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Excellent for Soaping Vats — not affected by hard water.

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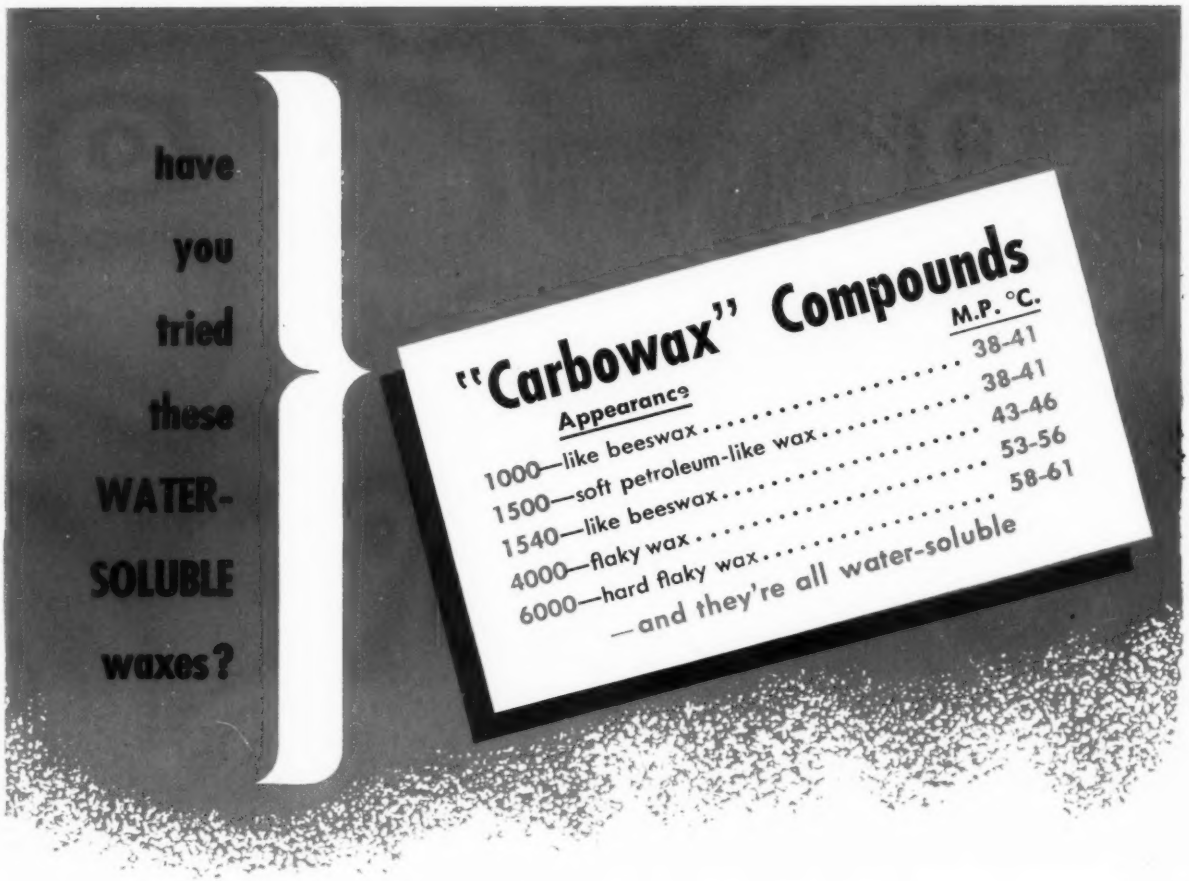

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White in color—transparent in solution

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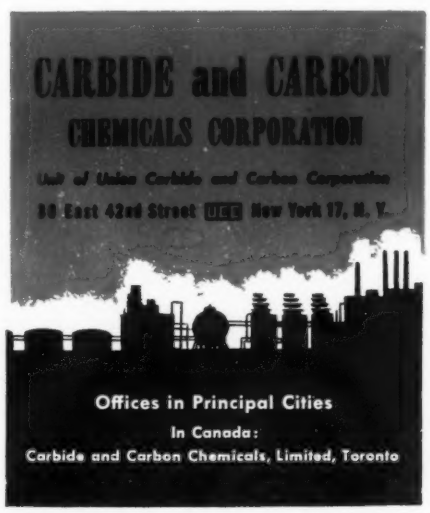
Versatile—can be blended with each other or with other glycols, alcohols, and esters to meet your specific requirements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The fatty acid esters of some CARBOWAX compounds are surface-active agents of the non-ionic type, valuable in emulsifying, detergent, and lubricating operations. Some of them are effective as dispersing agents for acetate dyes and rayon coning oils. These ester derivatives are not precipitated in water or decomposed by mild acids or alkalies.

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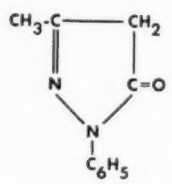
PHENYL METHYL PYRAZOLONE



1-Phenyl,3 Methyl Pyrazolone-5
White to light tan powder
MP – 127° C
less than 1% moisture

Intermediate for the production of dyestuffs—Developer-Z

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"Virginia" liquid SO_2 does a fine antichlor job in finishing cottons. 99.98+ percent pure—easy to store, handle, use. Shipped in cylinders, drums, tank cars. Our $Na_2S_2O_4$ is *concentrated*. A uniformly crystalline white powder—stable, free-flowing, quickly soluble in water. 250-pound single-trip steel drums. Use it freely as a reducing agent in your cotton vat-dyeing, stripping, decolorizing.

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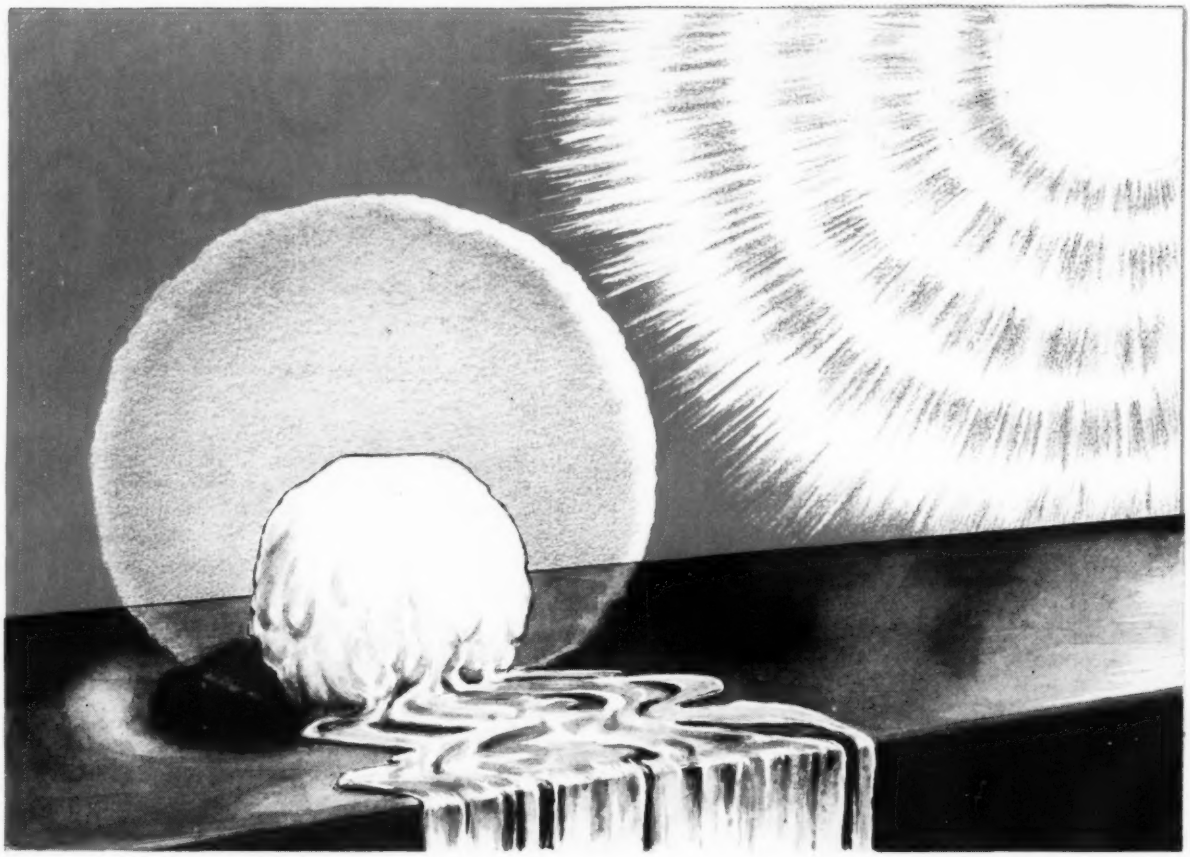

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There's no cure-all for finishing and dyeing troubles.

The variables that occur with almost every lot coming to your mill create daily problems for the men in charge of finishing operations.

Many of your dyeing and finishing troubles, however, melt like snow in the sun when you use Diastafor brand de-sizing agent—Type L. Diastafor—Type L is the all-purpose de-sizing agent that has been especially developed to help bleachers and dyers keep finishing headaches to an absolute minimum.

In fact, Diastafor users say its special values show up best on really difficult finishing jobs!

Diastafor—Type L works well and gives good results in an unusually wide range of temperatures and pH. This flexibility gives you the help you need when you have a "problem lot" to finish, or when variables in water or in sizing formulas create unexpected difficulties.

Diastafor will give you a good hand and a fine finish on cottons, rayons or mixed goods. It helps prevent streaky, uneven dyeing. The tensile strength of the fabric is never impaired. Diastafor will give you good results in continuous de-sizing.

The experience of our technical staffs has often proved valuable to our customers in solving finishing problems. They'll be glad to give you their help at any time, without obligation. Standard Brands Incorporated. *Diastafor Department*, 595 Madison Avenue, New York 22, New York.

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For maximum dryness, Koppers Ammonium Thiocyanate is now shipped in barrels lined with polyethylene plastic. Polyethylene's unusual resistance to moisture penetration *prevents water absorption.* And this polyethylene liner is tough and durable for long-lasting protection.

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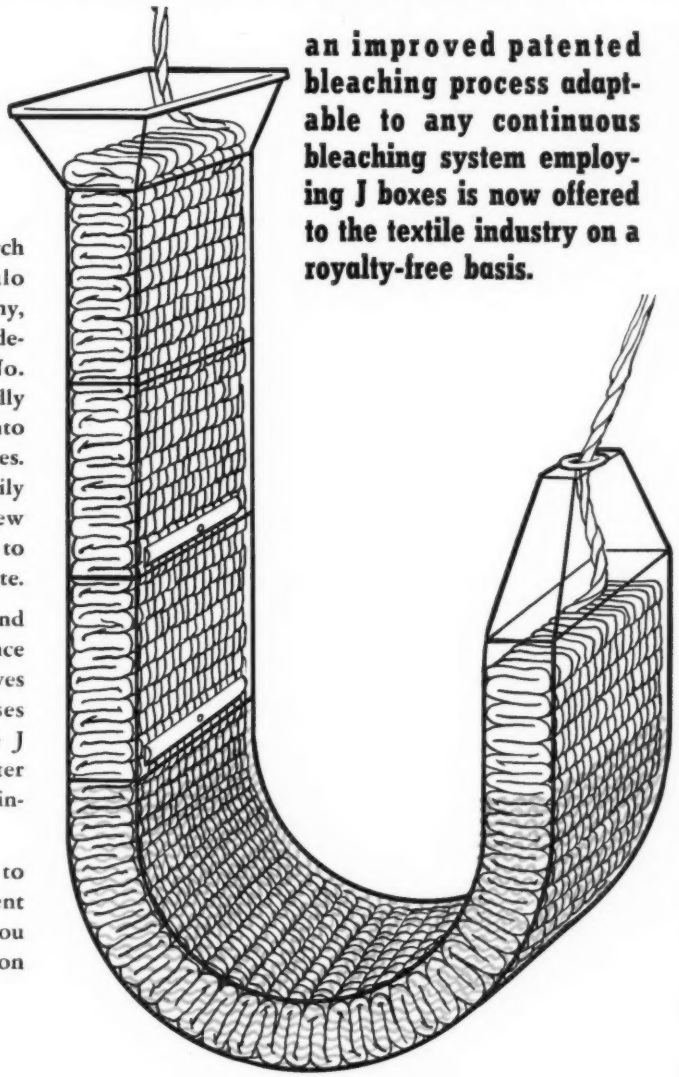

an improved patented bleaching process adaptable to any continuous bleaching system employing J boxes is now offered to the textile industry on a royalty-free basis.

● Developed in the research laboratories of the Buffalo Electro-Chemical Company, Inc., this new method is described in U. S. Patent No. 2,391,905. It consists basically of introducing hot water into the curved section of J boxes. Existing J boxes can be readily converted to utilize the new system. It is both simple to install and simple to operate.

Advantages include easier and more thorough washing. Since the water in the J box serves as a lubricant, cloth passes more freely through the J boxes. Moreover, the water helps maintain a clean stainless-steel surface.

For full details, please write to us. Our technical department will be glad to provide you with a complete explanation of this *wet-J-box* process.

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Full information and samples will be sent on request.

A TYPICAL ANALYSIS

Active Matter	41.25%	(Dry basis)
Inorganic Salts (principally Na_2SO_4)	58.20%	(Dry basis)
Unsulfonated Material	0.55%	(Dry basis)
Moisture	1.70%	
pH (1% solution)	7.50%	

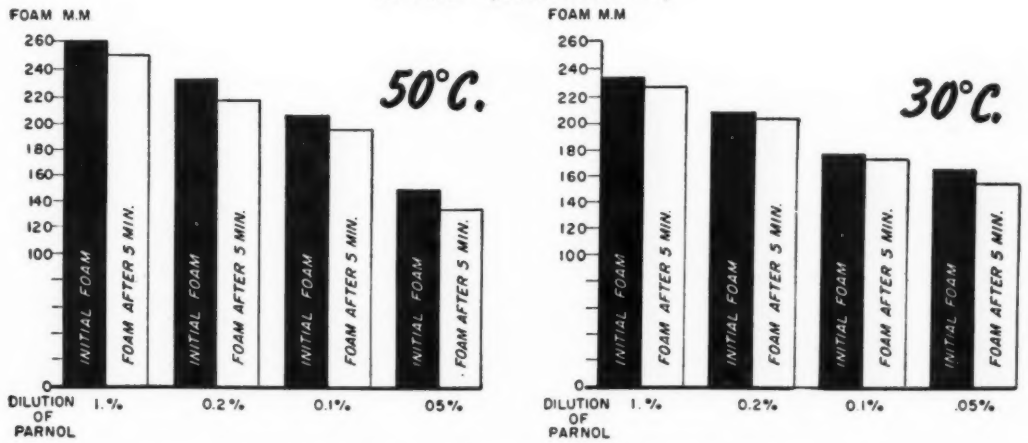
DRAVES WETTING TEST

TAP WATER — (HARDNESS 90 P. P. M.)

DILUTION	TIME
0.25%	6 sec.
0.20%	10 sec.
0.15%	12 sec.
0.10%	15 sec.

ROSS-MILES TEST

TAP WATER — (HARDNESS 90 P. P. M.)



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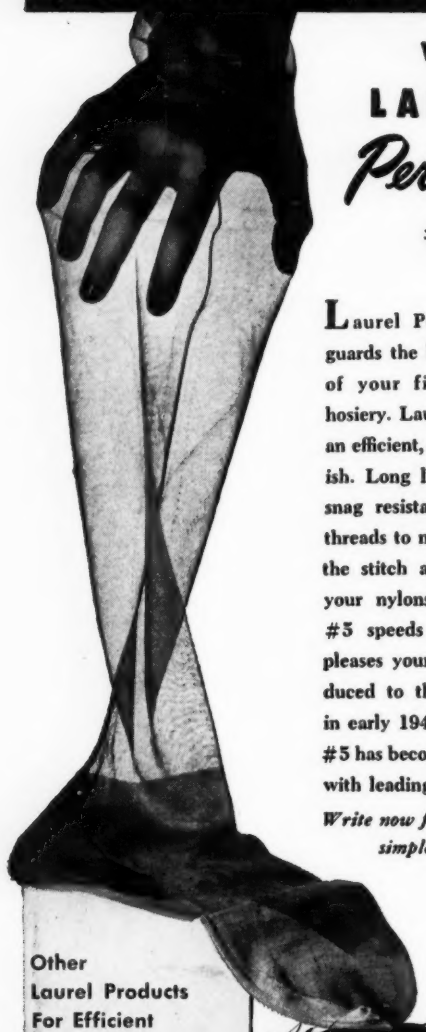

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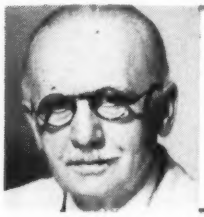

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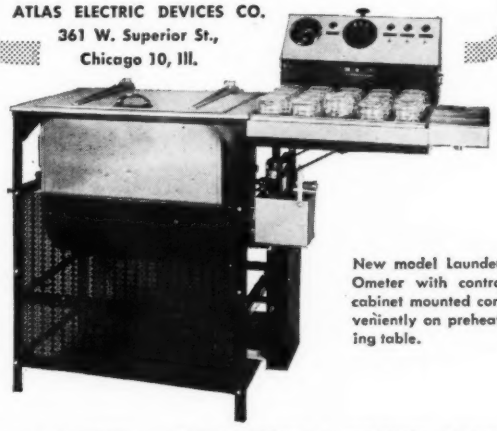

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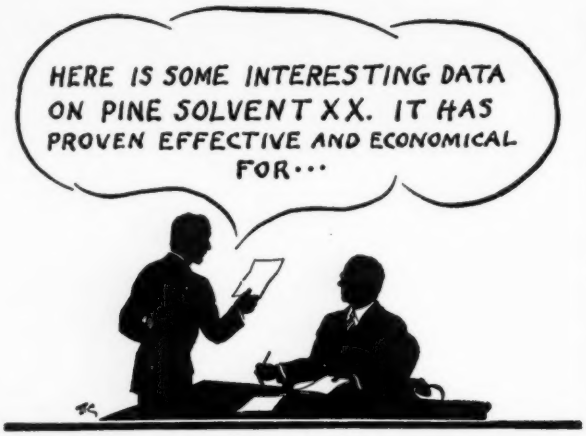

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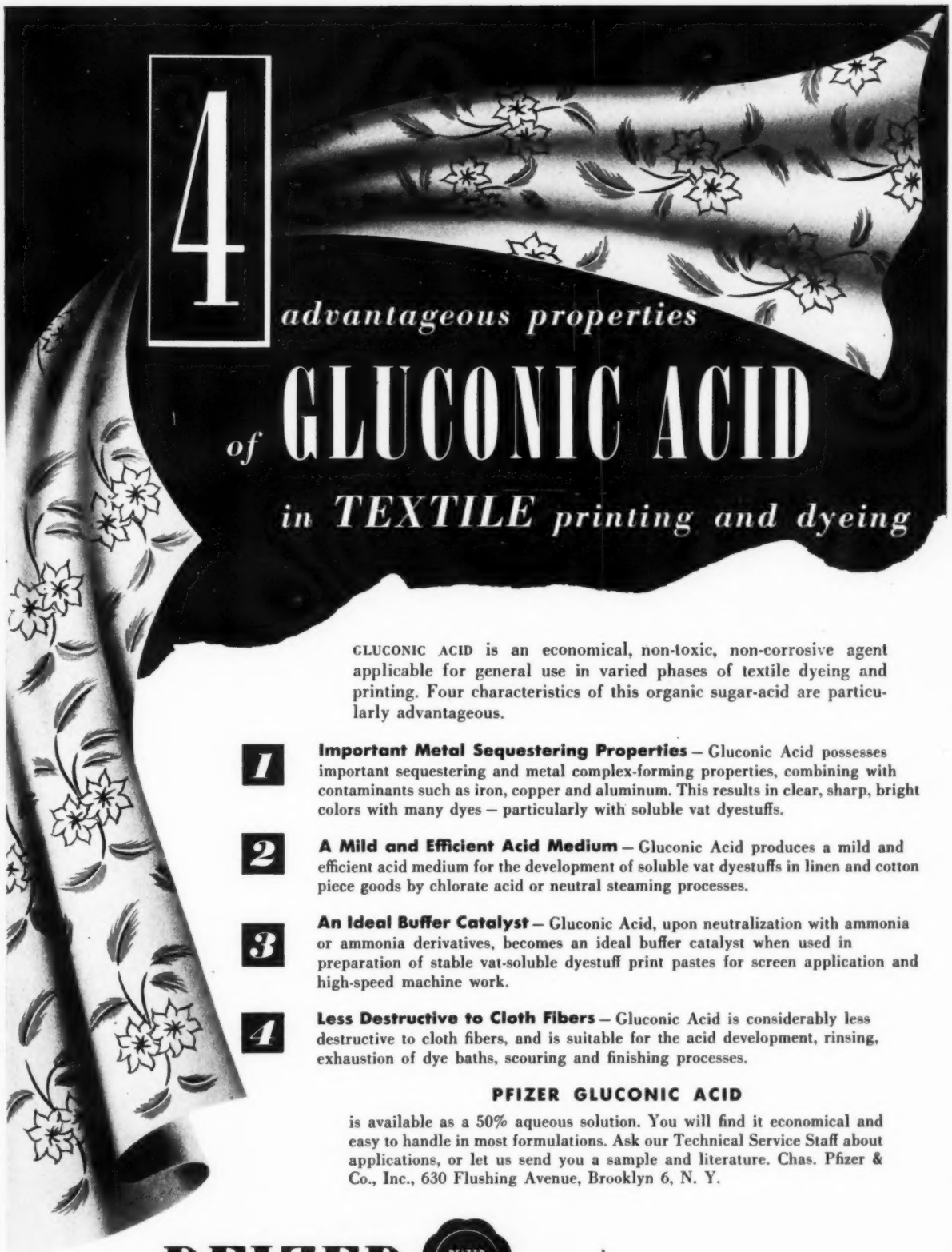

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